Head On™ 2

PART NO.
420-0311

MANUFACTURED BY

Gremlin®
Industries, inc.

OWNER'S MANUAL

HEAD ON 2

OWNER'S MANUAL

TABLE OF CONTENTS

INTRODUCTION

This is an electronic game that makes extensive use of digital integrated circuitry and television monitor circuitry. This manual assumes the maintenance technician possesses a general knowledge of solid state circuitry, microprocessor, TTL digital integrated circuitry and T.V. monitor concepts. Any individual NOT knowledgeable in these areas SHOULD NOT attempt repair of the electronic portion of this game. IT SHOULD BE NOTED THAT ANY ATTEMPT TO REPAIR THE GAME IN THE FIELD WITHOUT EXPRESS CONSENT OF THE FACTORY WILL IMMEDIATELY VOID THE WARRANTY!!!

IMPORTANT NOTES:

NEVER replace any components with anything other than exact replacement parts. (See Parts List located on Service Schematics.

NEVER remove circuit boards/connections while power is on.

DO NOT replace the fuse with anything other than the proper value. A blown fuse indicates an overload condition within the game. Replacing the fuse with a higher value can cause severe damage to internal components if an overload occurs.

ALWAYS consult the manual before attempting repairs.

CORRESPONDENCE regarding this game should be addressed to:

GREMLIN INDUSTRIES, INC.

8401 Aero Drive

San Diego, California 92123

(714) 277-8700

IMPORTANT NOTE

An important service note is posted in this game and is repeated here for emphasis:

> IF AT ANY TIME THE T. V. SCREEN SHOWS A MEANINGLESS DISPLAY
>
> OR THE GAME OTHERWISE MALFUNCTIONS, SIMPLY DROP A COIN INTO
>
> THE COIN MECHANISM. THIS SHOULD CORRECT THE PROBLEM. IF
>
> NOT, THE GAME REQUIRES SERVICE.

The circuitry in this game has been arranged so that the insertion of a quarter through the coin mechanism will reset the system.
This clears up temporary problems caused by power line disturbances, static, etc.

SERVICE TECHNICIAN NOTE:

The system reset circuitry described above requires that the coin counter is attached to the system. If there is a coin counter problem and no replacement is available, the game will function properly if a 10K Ohm resistor is connected across the coin counter input pins to the video logic board.

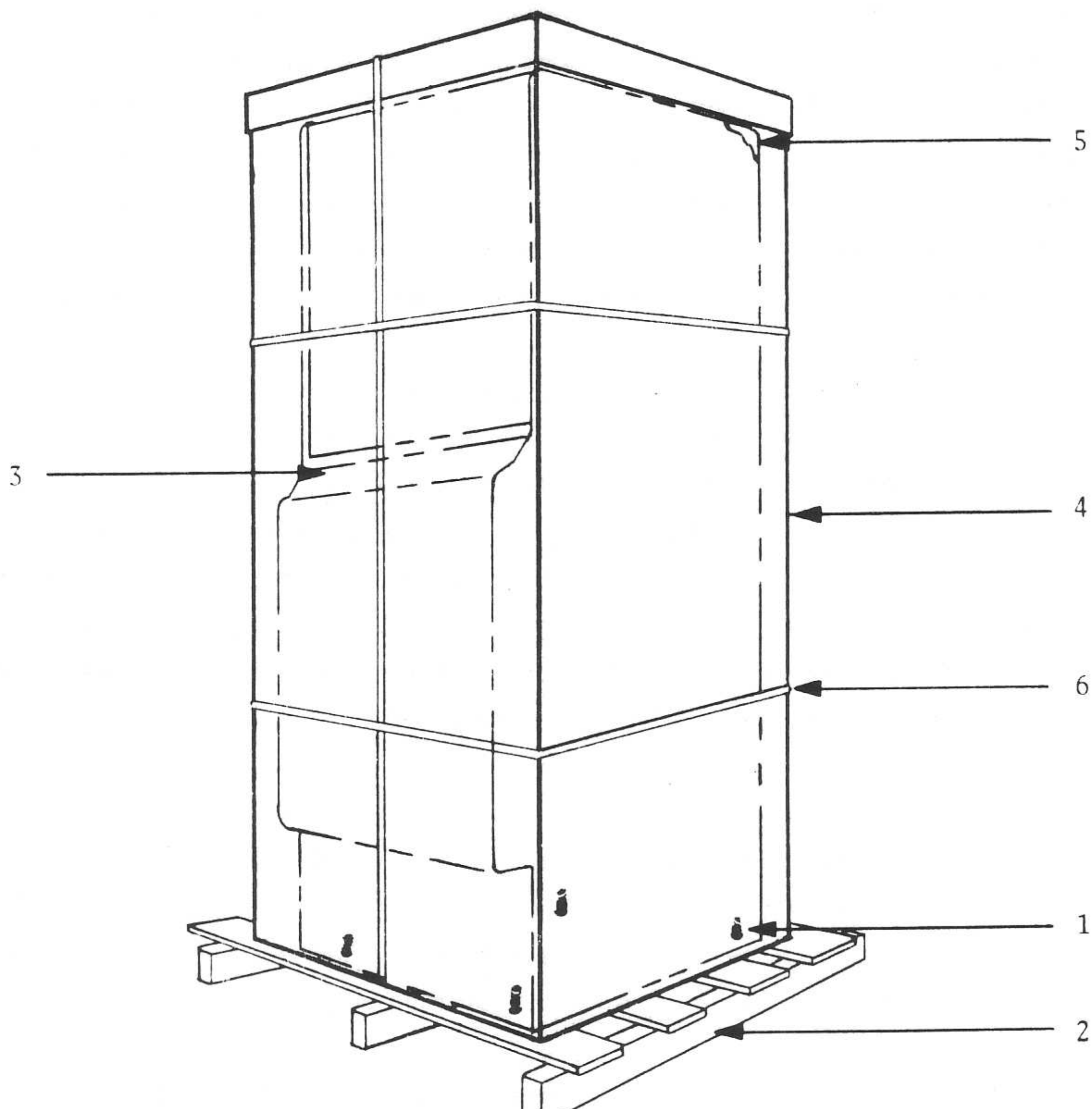
REPACKAGING INSTRUCTIONS

Should it be necessary to ship this game, follow the instructions below for game recrating:

A) If the original shipping bolts have been discarded (Ref.1), obtain four 5/16-18x1 3/4" hex head bolts with 5/16" flat washers. Carefully lay the game on its side and attach skid (Ref.2).

B) Place game upright. Tape game keys to upper flange of operator's panel (Ref.3). Crate the game using appropriate shock-absorbent packing material (Ref.4). Include padding on all four corners of the game (Ref.5). After crating is completed, secure package with strapping (Ref.6).

NOTE: If the game is to be shipped to GREMLIN for service or repair, attach a tag identifying the distributor and indicate the service or repair to be made; include the full serial number of the game. GAME MUST BE SHIPPED PREPAID.



HEAD ON 2-GAME CONCEPT

The most noticeable change on Gremlin's new HEAD ON 2 game, is the addition of two turn-around lanes on either side of the screen. With these turn-around lanes, HEAD ON 2 becomes a different game, even more challenging and exciting.

The game begins by displaying the following information on the screen:

BONUS
200

POINTS PER ...= 5
POINTS PER ◊◊ = 10

The computer's car and the player's car start at the bottom of the screen. When the player clears all lane markers against one computer car, he is awarded the 200 BONUS points and then is pitted against 2 computer cars. After clearing the lane markers again, 3 computer cars appear. Finally, 4 computer cars are the maximum amount that drive against the player. Each time a player clears all lane markers, the BONUS POINTS value is increased, so that more bonus points are awarded for beating 2 computer cars than for beating 1. In addition, the POINTS PER dot/diamonds values increase each time the bonus is awarded.

In HEAD ON 2, the player now has a few more lane options open to him in order to gain the most points and avoid a collision with the computer car. For example, if the player reverses his car's direction by passing through a turn-around lane, he then becomes either the pursuer or the pursued. If he is pursued by the computer car, the player must be careful to avoid a rear-end collision. If the player is following a computer car, he must again watch for a possible rear-end collision into the computer car. The different possibilities are what makes HEAD ON 2 an even more challenging and strategy-demanding game.

Also, each game is different from the next. While it is tempting to find a winnir pattern, the game will not necessarily respond the same way every time. Because of the varied combination of action, a working pattern for one game may not work for the next. This feature will keep them playing game after game; and, each time, new video excitement is there for all players.

Refer to the OPTIONS section of this manual for instructions on changing the number of player cars.

MAINTENANCE PROCEDURES- HEAD ON 2

I. POWER SUPPLY (refer to drawing #815-0020, sheet 4)

1. Remove output connectors from power supply.
2. Make these initial tests: (GND to BLACK lead on c18, 9000 mfd cpacitor)
   a) +9 V DC on POSITIVE terminal of C18
   b) +17-19 V on C6 (4700 mfd. cap.)
   c) -17-19 V on C5 (4700 mfd. cap.)
   d) -12 V at pin 11 (adjustable by trim pot R42)
   e) +12 V at pin 12 (adjustable by trim pot R8)
   f) +5 V at pins 18-20 (adjustable by trim pot R9)
   g) GND (ground, 0 V) at pins 14-16
   h) 2-3 V AC at pin 13 (Don't forget to change meter scale to AC)
3. Check these voltages again with the logic board connected. If any are wrong, a loading problem exists in the logic board, most likely. Possible causes of a short on the logic board could be: U73, C21, C25, or C26.

II. SOUND BOARD (refer to drawing #822-0002, sheet 6)

1. If no sounds are produced:
   a) check connections between logic board (labelled "Sound Out") and Sound board (pins 1 through 14) and between the Sound board and the Power Supply.
   b) If they are good, check IC U16 on the logic board, pins 2,5,6,9,12, 15,16,and 19 for outputs when each sound is produced.
   c) If the outputs are present, check the output of the sound board, pin 5. If the signals are present here (use an oscilloscope for best results) check the amplifier circuit on the power supply, specifically, U4, Q8, and Q9.

2. If some sounds are produced, but not all:
   a) repeat steps a and b, above.
   b) If these prove OK, check the specific circuit for each sound:

SOUND TYPE:	SOUND BOARD PIN #:	CHECK THESE PARTS:
Crash	Pin 1	Q2, U2, U1, U13
High Speed (computer car)	Pin 2	Q8, U9, U8, U7
Car on	Pin 3	Q9, Q6, U9, U12, Q10, U6, U5

High Speed (player car)	Pin 4	Q12, Q10, U12, U6, U5
Screech #1	Pin 6	Q14, U10, D7
Screech #2	Pin 7	Q13, U10, D6
Bonus	Pin 8	Q5, U4, U10, D8, C19

III. LOGIC BOARD (refer to drawing #822-0001, sheets 4,5, and 6)

1. Game does not reset at power on: (see sheet 5)
   a) check connector pin 3 on logic board for 3 V AC signal. Also, check Q10, Q11, U55, U54, and U71.
2. No video: (see sheet 5)
   a) check U48 (part #315-0042)for video signals. Also, check U41, Q6 and Q7 for the video signals.
3. Game does not coin: (see sheet 5)
   a) Check coin switch connections to the logic board; make sure the coin switch is wired correctly.
   b) Check U12, pins 3 and 11 for a pulse each time the coin switch is activated. Also, check U11 and U13.
   c) Check also for the 4 msec. pulses at pin 7 of U10. These pulses serve as timing for the video circuit. Check also pin 5 of U11; pin6, U13.
   d) If a game is started only occasionally when a coin is deposited, the coin switch wire may need to be adjusted for a lighter, or heavier, tension.
   e) If the coin counter does not activate, check U12, pin 3 for a pulse each time the coin switch is activated; also, check Q1 and Q2. (see sheet 5)

4. No Ø1 clock pulses to the microprocessor:(see sheet 4)
   a) check for pulses at the crystal, Y1.
   b) check for pulses at pin 6 of U68; at pin 6 of U49; and at pin 4 of U54.

5. No player control: (see sheet 5)
   a) make sure the player control connections from the switches to the

logic board are intact. Ensure that each switch is connected.

b) If these are good, check for an output from U1 as you push each switch.

6. Random display on the screen:

a) If the screen shows what appears to be a meaningless display, and it cannot be cleared by activating the coin switch, several different parts of the circuit should be considered:

One or more RAM's, U56 through U63 (sheet 5)

One of the programmed IC's, or EPROM's (sheet 6)Check their sockets.

The reset circuit is not working.(see #1, above)

The microprocessor is bad. (sheet 4)

Data or address bus problem (e.g. U33 or U34, sheet 4, could be bad)

TRANSFORMER VOLTAGE CONVERSION INSTRUCTIONS:

To convert the game transformer to 100, 115, or 230 VAC, refer to the following chart:

For 100 Volts: Connect the voltage INPUT lines to terminals 1 and 2 on the transformer.

For 115 Volts: Connect the voltage INPUT lines to terminals 1 and 3.

For 230 Volts: Connect the voltage INPUT lines to terminals 1 and 4, with terminal 3 connected to the LAMP circuit.

Also, the TV monitor must be converted to the same voltage input as the game transformer. Refer to the monitor manual included in the game.

OPTIONS SELECTION CHART: To select the desired number of player cars. (Locate logic board connector labelled 'P3'.

# of Cars	Pin 1	Pin 2
4	HI	HI
5	LO	HI
5	HI	LO
6	LO	LO

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE TOP ASS'Y HEADON 2	722-0013 DWG NO	SH 1 OF 9	A REV
		DRAWN S. MAGNOLIA	ENGR		
		CHECK Steve J. Fay 10-2-79	APPR		

LTR	DATE	REVISION DESCRIPTION	DRAFT	CHECK	APPR
A	9-27-79	RELEASED 10-2-79	MAGNOLIA	SJF.	SJF.

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE TOP ASSY HEAD ON 2	722-0013 DWG NO	SH 2 OF 9	A REV

ITEM NO	PART NO	QTY PER ASSY					DESCRIPTION	REF DES
1	800-0054	1					SPEAKER GAME 6X9	
2	130-0002	1					SPEAKER COVER 6X9	
3	140-0021	1					COVER JUNCTION BOX	
4	140-0033	1					CABINET HEAD ON 19"	
5								
6	200-0011	1					MONITOR COLOR 19" ALGOL	
7	252-0075	1					MONITOR BOARD	
8								
9	822-0035	1					ASSY COIN MECHANISM	
10	210-0011	2					CONN INSUL BUTTSPLICE	
11	250-0032	1					FRAME BEZEL	
12	250-0034	1					SPRING RETAINER	
13	250-0038	1					MOLDING STRIP	
14	250-0048	1					CLIP SWITCH	
15								
16	250-0356	2					BRACKET MONITOR SUPP.	
17	181-0031	1					CHOKE 250uh 2.5A	
18	156-0001	1					CAP 0.47uf 200V	
19	253-0105	1					PANEL LOGO GRAPHIC	
20	253-0104	1					MONITOR PLEXIGLASS	
21								
22								
23	390-0011	1					LAMP FLOR.	
24	280-0004	25					CLIP WIRE HOLD DOWN	
25								

FORM NO. 001-1501

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE TOP ASS'Y HEAD ON 2	722-0013 DWG NO	SH 3 OF 9	A REV

ITEM NO	PART NO	QTY PER ASSY					DESCRIPTION	REF DES
26	280-0005	11					CABLE TIES	
27	280-0010	4					WIRE NUT	
28								
29								
30	800-0052	1					ASS'Y FLOR LAMP 18"	
31								
32	420-0028	1					S/N DECAL	
33	420-0030	1					DECAL CAUTION 115 V	
34	420-0038	2					IMPORTANT NOTE	
35	420-0040	1					DECAL RE-CYCLE	
36	420-0041	1					DECAL S/N SMALL	
37	420-0060	1					DECAL TIP-N-TELL	
38	420-0071	1					UNCRATING INSTRUCTIONS	
39	420-0116	1					WRAPAROUND SIDE	
40	420 0117						TOP COVER	
41	420-0124	4					CORNER STRIP	
42	420-0294	1					MANUAL ALGOL 19" COLOR	
43	420-0307						GRAPHIC LEFT SIDE	
44	420-0308						GRAPHIC RIGHT SIDE	
45	420-0309						GRAPHIC INTERIOR	
46	420-0310	1					DECAL CARTON	
47	420-0311	1					MANUAL HEAD ON	
50	807-0009	1					JUNCTION BOX	

FORM NO. 001-1501

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE TOP ASS'Y HEAD ON 2	722-0013 DWG NO	SH 4 OF 9	A REV

ITEM NO	PART NO	QTY PER ASSY					DESCRIPTION	REF DES
51	800-0029	1					HARN ASSY GROUND CABLE	
52								
53	815-0020	1					ASSY GAME PWR SUPPLY	
54								
55								
56								
57	822-0002	1					ASS'Y SOUND BOARD	
58	822-0034	1					CONTROL PNL ASS'Y COMP.	
59	822-0031	1					LOGIC BOARD	
60								
61								
62								
63								
64	822-0021	1					ASS'Y HARN MONITOR JUMPER	
65	822-0022						ASS'Y HARN GROUND CABLE	
66								
67		1					PALET HEAD-ON	
68		6					MACH SCR #8-32 X 2 SLOT HD	
69		4					PHL PAN HD SCR #6-X 3/8 SHT MTL	
70		7					SCR #6 X 1/2 PHL PAN HD SHT MTL	
71		4					SCR #8-32 X 1 1/2 SLOT HD	
72		2					NUT HEX #10-32	
73		4					SCR #8-32 X 1 1/2 SLOT HD	
74		14					BOLT CARRIGE 10-24 X 1 3/4	
75		6					SCR 10-32 X 1.0 PHL PAN HD	

FORM NO. 001-1501

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE TOP ASS'Y HEAD ON 2	722-0013 DWG NO	SH 5 OF 9	A REV

ITEM NO	PART NO	QTY PER ASSY					DESCRIPTION	REF DES
76		6					WASHER LOCK SPLIT #10	
77		10					WASHER FLAT #8	
78		10					WASHER LOCK SPLIT #8	
79		12					WASHER FLAT #10	
80		6					NUT HEX 10-24	
81		10					NUT HEX 8-32	
82		8					NUT WING 10-24	
83								
84								
85		24"					ZIP CORD	

FORM NO. 001-1501

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE PC ASSY - POWER SUPPLY	815-0021 DWG NO	SH 1 OF	B REV

ITEM NO	PART NO	QTY PER ASSY					DESCRIPTION	REF DES
1	170-0082					1	PCB - POWER SUPPLY	
2	150-0019					2	CAP E 4700 µF, 25V	C5, C6
3	151-0001					1	CAP. CER .05 µF, 50V	C11
4	151-0002					2	CAP. CER 100PF, 50V	C17, C19
5	151-0008					1	CAP. CER .001 µF, 50V	C10
6	151-0011					3	CAP. CER .01 µF, 50V	C12, C14, C16
7	151-0012					1	CAP. CER. .1µF, 50V	C3
8	153-0001					5	CAP. TANT 10µF, 25V	C1, C2, C7, C13, C15
9								
10	212-0003					2	CONN M 10 PIN	
11	212-0004					2	CONN M 4 PIN	
12								
13	313-0001					1	IC LM723	U3
14	313-0004					3	IC LM741EN	U1, U2, U4
15								
16	471-0101					1	RES 100Ω, 1/2W, 5%	R15
17	471-0102					10	RES 1KΩ, 1/2W, 5%	R5, 17, 20, 22-24, 35, 36, 38, 39
18	471-0103					4	RES 10KΩ, 1/2W, 5%	R1, R14, R21, R37
19	471-0104					1	RES 100KΩ, 1/2W, 5%	R33
20	471-0122					1	RES 1.2KΩ, 1/2W, 5%	R18
21	471-0152					2	RES 1.5KΩ, 1/2W, 5%	R13, R16
22	471-0272					5	RES 2.7KΩ, 1/2W, 5%	R7, R25, R26, R43, R46
23	471-0332					1	RES 3.3KΩ, 1/2W, 5%	R32
24	471-0471					2	RES 470Ω, 1/2W, 5%	R34, 40
25	471-0473					2	RES 47KΩ, 1/2W, 5%	R44, R45

FORM NO. 001-1501

Gremlin Industries, Inc.
San Diego, California 92123

PARTS LIST

TITLE PC ASSY - POWER SUPPLY

DWG NO 815-0021 | SH 3 OF | REV B

ITEM NO	PART NO	QTY PER ASSY					DESCRIPTION	REF DES
26	471-0562					1	RES 5.6KΩ, 1/2W, 5%	R12
27	472-00R5					4	RES 0.5, 1W, 5%	R4, R29-R31
28	473-00R1					1	RES 0.1, 5W, 3%	R28
29								
30	475-0004					1	POT 1K TRIMMER	R9
31	475-0005					2	POT 2K TRIMMER	R8, R42
32								
33	481-0004					4	DIODE MR501	D1-D4
34	481-0006					2	DIODE 1N914	D7, D8
35	481-0008					1	DIODE ZENER 1N5231	D10
36								
37	482-0006					3	TRANSISTOR 2N4403	Q1, Q3, Q4
38	482-0013					1	TRANSISTOR TIP 110	Q6
39	482-0014					2	TRANSISTOR 2N4401	Q2, Q5
40	482-0015					1	TRANSISTOR TIP 115	Q7
41	482-0016					2	TRANSISTOR TIP 29	Q8, Q9
42								
43	471-0133					1	RES 13K OHMS 1/2W 5%	R41
44								
45	815-0020					REF	SCHEMATIC	
46								
47								
48								
49								
50								

FORM NO. 001-1001

GREMLIN IND INC SAN DIEGO CA. 92123	PARTS LIST	TITLE ASSY, POWER SUPPLY	815-0020 DWG NO	SH 1 OF 4	A REV

RELEASED	DRAWN LEE J. LIPTAK	ENGR
DESIGN	CHECK [signature]	APPR

LTR	AUTH	REVISION DESCRIPTION	DRAFT	CHECK	APPR
A		RELEASED	[signature]	2/1/78	E.H.D.
		SHT. 3 IS "D" SIZE SHT 4 IS 'C' SIZE			

GREMLIN IND. INC. SAN DIEGO CA. 92123	PARTS LIST	TITLE ASSY, POWER SUPPLY	815-0020 DWG NO	SH 2 OF 3	A REV

ITEM NO	PART NO	QTY PER ASSY								DESCRIPTION	REF DES
1	140-0015								1	CHASSIS, POWER SUPPLY	
2	150-0022								1	CAP, E, 9000 µF 12V	
3	211-0005								9	CONN CRIMP LOCK	
4	211-0007								1	CONN, KEY, POLARIZING	
5	211-0017								4	CONN, QUICK, 1/4" FEM	
6	211-0019								2	CONN, SPADE LUG 1/4"	
7	212-0016								1	CONN FEM 10 PIN	
8	213-0006								1	SOCKET, TO-3	
9	280-0014								4	STAND-OFFS, CLIPS	
10	280-0056								1	CLAMP, CAP. VR4 1 1/2"	
11	481-0009								1	DIODE, MDA 3500	
12	482-0007								1	XISTOR, 2N3055	
13	560-0003								1	XFMR. MODEL 4-10345B	
14	815-0021								1	POWER SUPPLY ASSY (PCB)	
	815-0020									SCHEM. ASSY. PWR. SUPP.	(REFERANCE)
15									5	SCREW-MACH P.HD #6-32 X.5	
16									4	NUT HEX #6-32	
17									4	SCREW-MACH RD, HD #4-40 X.37	
18									4	NUT HEX #4-40	
19									4	RIVET, POP 3/16	
20									4	SCR, MACH, HEX, WAS, HD 1/4-20 X	5/8"
21									1	SCR, MACH, P.HD. #6-32 x 1.0"	

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE HEAD ON SOUND	822-0002 DWG NO	SH 1 OF 6	B REV

SHT 5 & 6 "D" SIZE	DRAWN Wyneema 11-9-78	ENGR
	CHECK Steven J. Fry 12-22-78	APPR

LTR	DATE	REVISION DESCRIPTION	DRAFT	CHECK	APPR
A	1-8-79	RELEASED	WJB	SJF	SJF
B	1-25-79	ECN 273 ADDENDUM 273 2-12-79 SJF 2-12-79	KB	SJF	SJF

FORM NO. 001-1500

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE HEAD ON SOUND	822-0002 DWG NO	SH 2 OF 6	B REV

ITEM NO	PART NO	QTY PER ASSY					DESCRIPTION	REF DES
1								
2	151-0011	6					CAP CER .01 µf 50V	C8,13,17,32,21,22
3	151-0012	4					CAP CER .1 µf 50V	C5,C12,C26,C27
4	152-0001	3					CAP FILM .1 µf 100V	C31,C20,C25
5								
6	152-0012	3					CAP FILM .047 µf 200V	C2,C23,C24
7	152-0018	3					CAP FILM .01 µf 250V	C3,C6,C19
8	152-0020	3					CAP FILM .47 µf 100V	C1,C18,C16
9	153-0001	7					CAP TANT 10 µf 25V	C10,C11,C28-C30,C33,C34
10	153-0002	2					CAP TANT 1 µf 25V	C4,C9
11	153-0003	2					CAP TANT 2.2 µf 25V	C14,15
12	153-0004	1					CAP TANT 4.7 µf 25V	C7
13	170-0154	1					PCB HEAD ON SOUND	
14	212-0031	1					CONN M 12 PIN	P1
15	313-0004	1					IC LM741 EN DIP	U3
16	313-0008	1					IC LM348 DIP	U1
17	314-0001	5					IC NE555 DIP	U2,U4,U9,U12,U14
18	315-0005	4					IC 4013	U5-U8
19	315-0009	1					IC 4081	U11
20	315-0035	1					IC MM5837	U13
21	315-0043	1					IC 4069	U10

FORM NO. 001-1501

Gremlin Industries, Inc.
San Diego, California 92123

PARTS LIST

TITLE HEAD ON SOUND

DWG NO 822-0002 | SH 3 OF 6 | REV B

ITEM NO	PART NO	QTY PER ASSY					DESCRIPTION	REF DES
22	471-0101	2					RES 100 OHM 1/2W 5%	R23, R32
23	471-0102	10					RES 1K OHM 1/2W 5%	R4, R5, R8, R14, R22, R35,
								R45, R55, R72, R48
24	471-0103	16					RES 10K OHM 1/2W 5%	R10, R12, R13, R25,
								R43, R46, R50, R56-R60,
								R64, R67, R68, R75
25	471-0104	17					RES 100K OHM 1/2W 5%	R15-R21, R24, R34, R38
								R41, R42, R62, R65, R69,
								R71, R76
26	471-0105	3					RES 1 MEG OHM 1/2W 5%	R3, R70, R77
27	471-0124	4					RES 120K OHM 1/2W 5%	R47, R51, R63, R66
28	471-0153	2					RES 15K OHM 1/2W 5%	R1, R2
29	471-0154	1					RES 150K OHM 1/2W 5%	R39
30	471-0220	1					RES 22 OHM 1/2W 5%	R49
31	471-0224	1					RES 220K OHM 1/2W 5%	R40
32	471-0394	8					RES 390K OHM 1/2W 5%	R26-R31, R44, R73
33	471-0472	3					RES 4.7K OHM 1/2W 5%	R36, R52, R74
34	471-0473	1					RES 47K OHM 1/2W 5%	R33
35	471-0474	2					RES 470K OHM 1/2W 5%	R9, R11
36	471-0682	2					RES 6.8K OHM 1/2W 5%	R53, R54
37	475-0006	2					POT 100K	R6, R7
38	481-0006	8					DIODE IN914/IN4148	D1-D8

FORM NO. 001-1501

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE HEAD ON SOUND	822-0002 DWG NO	SH 4 OF 6	B REV

ITEM NO	PART NO	QTY PER ASSY					DESCRIPTION	REF DES
39	482-0006	2					XSTR 2N4403	Q6, Q10
40	482-0014	9					XSTR 2N4401	Q2, Q5, Q7-Q9, Q11-Q14
41	482-0023	2					XSTR 2N4093	Q3, Q4
42	471-0223	1					RES 22K OHM 1/2W 5%	R37
43								

FORM NO. 001-1501

Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE ASSY BASIC V.I.C. BD.	800-0031 DWG NO	SH 1 OF 8	C REV
SHT 5,6,7,8 "D" SIZE		DRAWN Wjnema 11-20-78	ENGR		
		CHECK Steve J. Fay 12-22-78	APPR		

LTR	DATE	REVISION DESCRIPTION	DRAFT	CHECK	APPR
A	12-22-79	RELEASED	WJB	SF	SF
B	5-10-79	CHG'D PER ECN 310	SB	SF	SF
C	7-5-79	CHG'D PER ECN 318 & 321 8-8-79	WJB	SF	SF

FORM NO. 001-1500

Gromlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE ASSY BASIC V.I.C. BD.	800-0031 DWG NO	SH 2 OF 8	C REV

ITEM NO	PART NO	QTY PER ASSY					DESCRIPTION	REF DES
1	151-[illegible]	1					CAP CER 680 pf 50V	C39
2	151-0012	54					CAP CER .1 µf 50V	C3,5,7-11,13-17,22,25,
3								C27-38,C40-67
4	152-0001	1					CAP FILM .1 µf 100V	C4
5	152-0017	1					CAP FILM .33µf 100V	C24
6	153-0001	6					CAP TANT 10 µf 25V	C12,20,21,23,26,68
7	153-0002	1					CAP TANT 1 µf 25V	C19
8	151-0011	2					CAP CER .01 µf 50V	C69,C70
9	170-0150	1					PCB C.V. LOGIC	
10								
11	211-0004	7					CONN PIN TEST PT	TP1-TP4,GND
12	212-0063	4					CONN M 4 PIN PLZD	
13	212-0021	7					CONN M 10 PIN	
14	212-0031	2					CONN M 12 PIN	
15	213-0003	4					SKT 14 PIN DIP	XU14,30,69,70
16	213-0001	8					SKT 24 PIN DUAL INLN	XU20-XU27
17	213-0004	18					SKT 16 PIN DUAL INLN	XRP2,XU5-8,33,34,44,
18								XU56-63,65,66
19	213-0005	2					SKT 40 PIN DUAL INLN	XU48,XU53
20	213-0008	7					SKT 20 PIN DUAL INLN	XU1-3,15,16,19,28
21	213-0011	2					SKT 22 PIN DUAL INLN	XU17,XU18
22	213-0010	1					SKT 8 PIN DIP	XU9
23	230-0009	1					XTAL CLK 15.46848	Y1
24	313-0023	1					IC 320T-5.0	U73
25	314-00[illegible]1	2					IC NE555	U10,U55

FORM NO. 001-1601

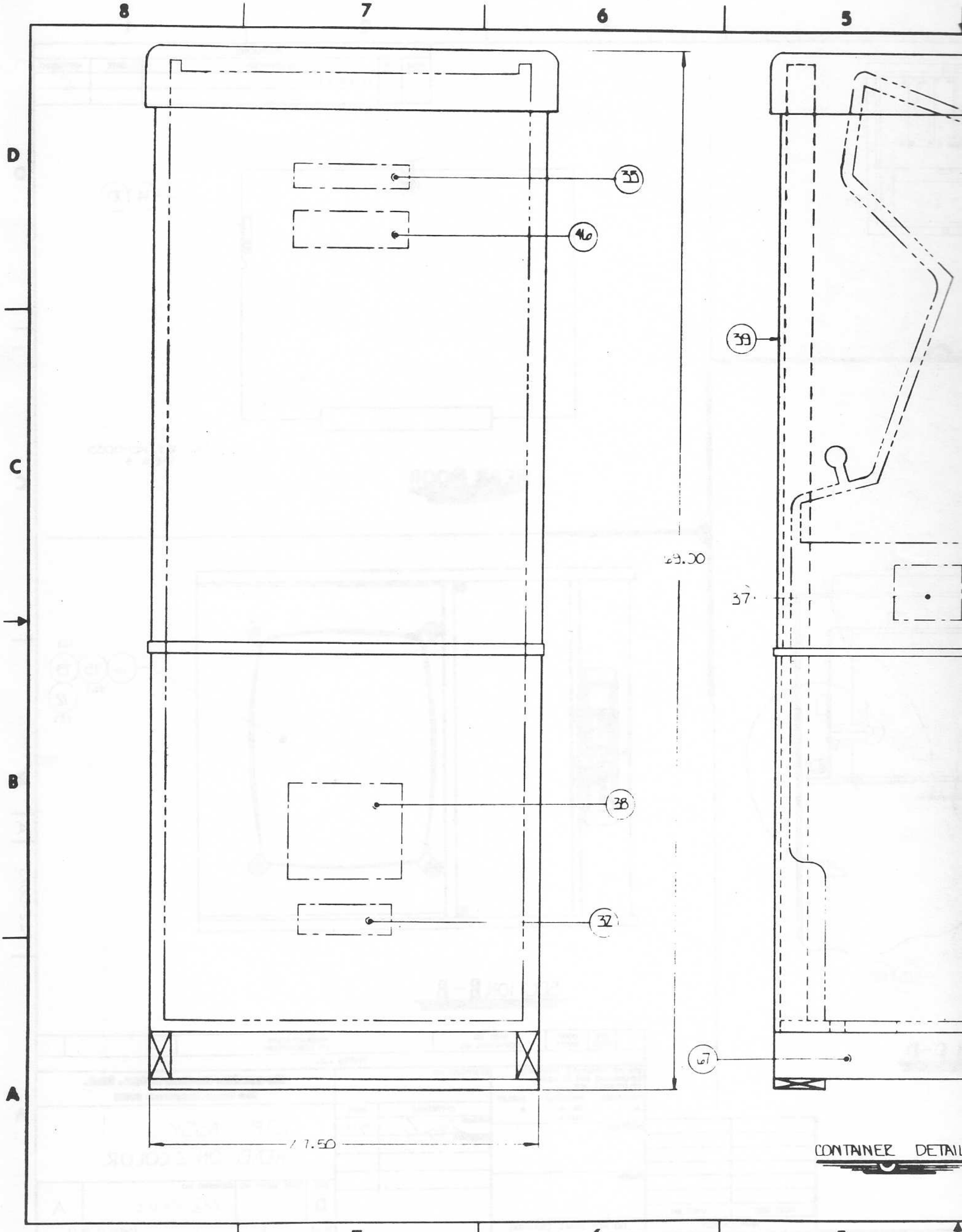
Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE ASSY BASIC V.I.C.BD.	800-0031 DWG NO	SH 3 OF 8	C REV

ITEM NO	PART NO	QTY PER ASSY					DESCRIPTION	REF DES
26	314-0015	1					IC 7404	U54
27	314-0018	3					IC 74LS00	U4,U12,U32
28	314-0019	2					IC 74LS04	U35,U64
29	314-0040	3					IC 74LS125	U13,U46,U47
30	314-0046	1					IC 74S04	U68
31	314-0073	3					IC 74LS175	U45, U49,U50
32	314-0055	2					IC 74LS244	U1, U19
33	314-0058	6					IC 74LS08	U29,37-39,41,71
34	314-0059	1					IC 74LS10	U52
35	314-0061	1					IC 74LS42	U40
36	314-0062	4					IC 74LS74	U11,U31, U67,U72
37	314-0078	1					IC 74LS02	U36
38	314-0092	2					IC 8216	U33,U34
39	315-0039	8					IC 4K RAM 12V	U56-U63
40	315-0031	1					IC Z80 MK3880	U53
41	314-0086	1					IC 74LS163	U66
42	314-0093	1					IC 74LS374	U16
43								
44	316-0206	1					IC PROM 32X8 CTL	U65
45	316-0138	1					IC PROM 32x8	U44
46	390-0003	1					LED RED	D4
47	471-0220	3					RES 22 OHM 5%	R26-28
48	471-0011	5					RES 10 OHM 1/2W 5%	R50-53, R29
49	471-0102	10					RES 1K OHM 1/2W 5%	R7-11,32,37,56-58
50	471-0103	1					RES 10K OHM 1/2W 5%	R6

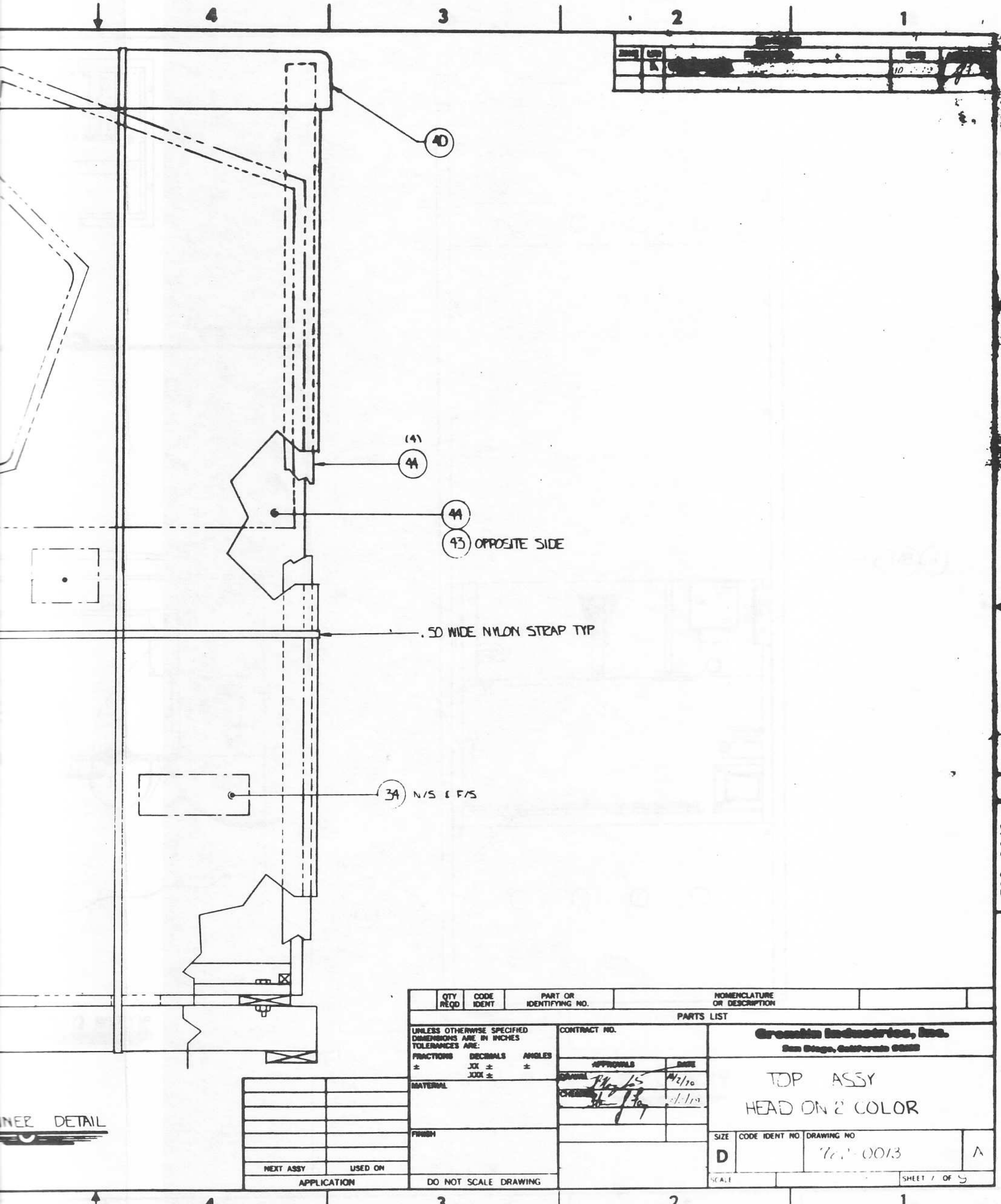
Gremlin Industries, Inc. San Diego, California 92123	PARTS LIST	TITLE ASSY BASIC V.I.C.BD.	800-0031 DWG NO	SH 4 OF 8	C REV

ITEM NO	PART NO	QTY PER ASSY					DESCRIPTION	REF DES
51	471-0104	3					RES 100K OHM 1/2W 5%	R42 - R44
52	471-0222	8					RES 2.2K OHM 1/2W 5%	R18 - R25
53	471-0223	1					RES 22K OHM 1/2W 5%	R3
54	471-0331	8					RES 330 OHM 1/2W 5%	R30,31,33,34,45,46,59,60
55	471-0221	1					RES 220 OHM 5%	R55
56	471-0471	1					RES 470 OHM 1/2W 5%	R49
57	471-0472	3					RES 4.7K OHM 1/2W 5%	R5, R47, R48
58	471-0750	1					RES 75 OHM 1/2W 5%	R41
59								
60	475-0001	1					POT 10K PC MTV	R4
61								
62	477-0002	2					RES PACK 15 X 2.2K	RP1, RP3
63								
64	481-0006	4					DIODE IN914/IN4148	D1, D2, D5, D6
65								
66	482-0006	1					XSTR 2N4403	Q6
67	482-0010	1					XSTR PE8050	Q2
68	482-0014	4					XSTR 2N4401	Q1, Q7, Q10, Q11
69	510-0049	1					SWITCH 8 POS DIP SPST	SW1
70	530-0006	1					HEATSINK 295-1	
71								
72								
73	314-0072	1					IC 74LS174	U43
74								
75	314-0076	1					IC 74LS157	U42

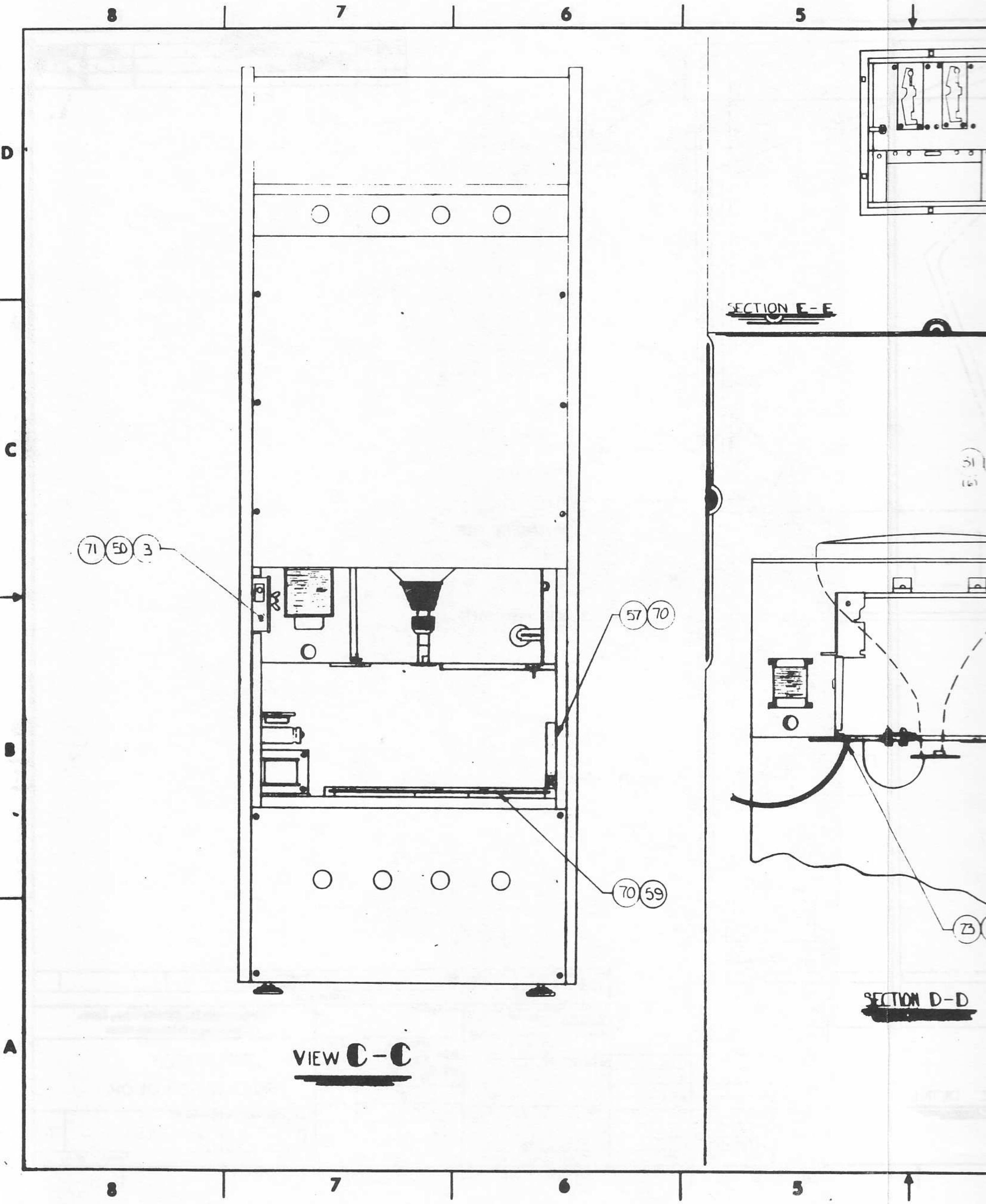
FORM NO. 001-1501



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CONTAINER DETAIL

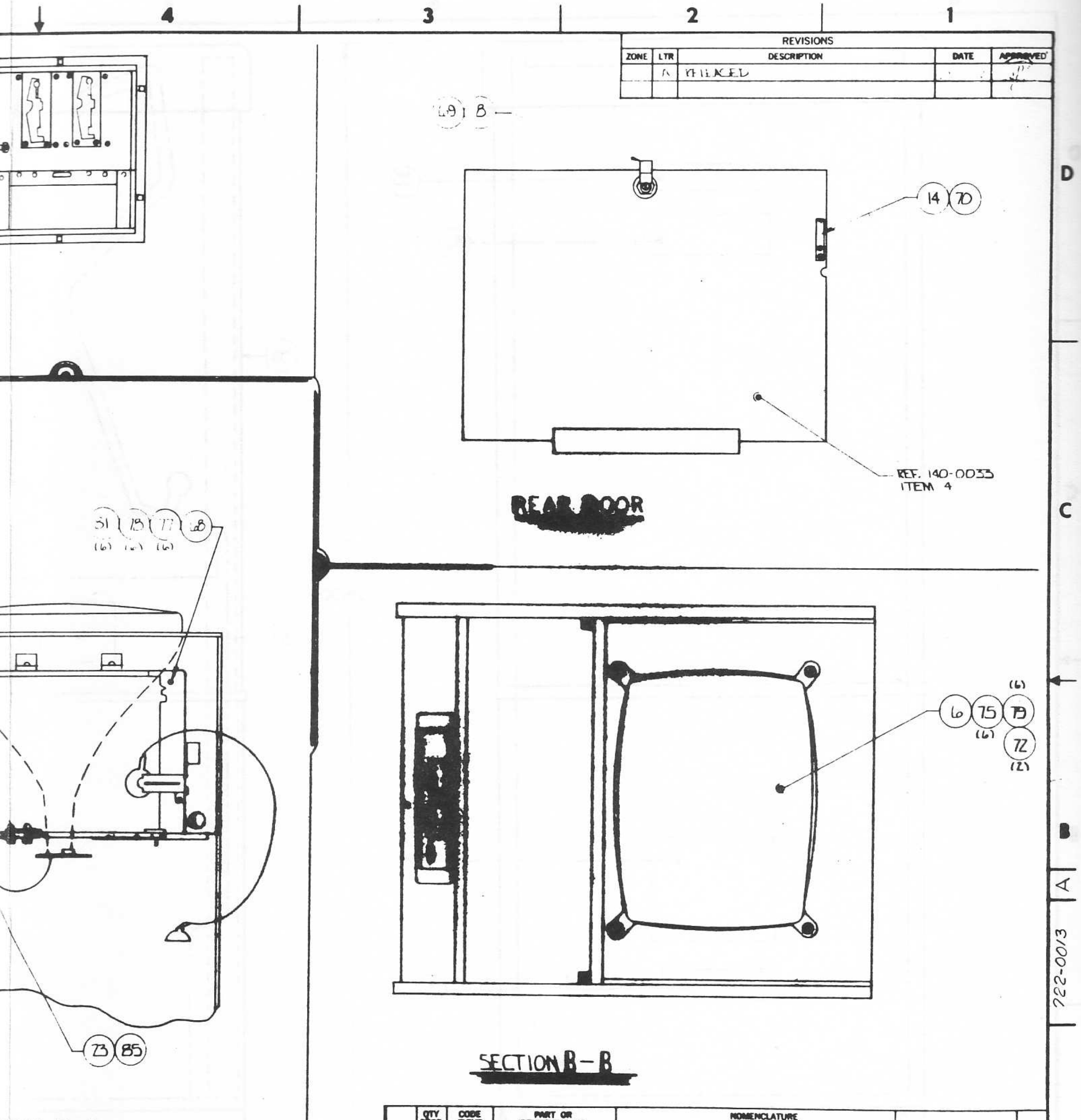


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43 OPPOSITE SIDE
.50 WIDE NYLON STRAP TYP
34 N/S & F/S
NER DETAIL
QTY REQD
CODE IDENT
PART OR IDENTIFYING NO.
NOMENCLATURE OR DESCRIPTION
PARTS LIST
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
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DECIMALS
ANGLES
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APPROVALS
DATE
DRAWN
CHECKED
MATERIAL
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NEXT ASSY
USED ON
APPLICATION
DO NOT SCALE DRAWING
TOP ASSY
HEAD ON 2 COLOR
SIZE
CODE IDENT NO
DRAWING NO
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0013
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SCALE
SHEET 1 OF 5



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SECTION E-E
SECTION D-D
VIEW C-C

		REVISIONS		
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED		



QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

CONTRACT NO.

APPROVALS	DATE
DRAWN	7/24/79
CHECKED	

Gremlin Industries, Inc.
San Diego, California 92123

TOP ASSY
HEAD ON 2 COLOR

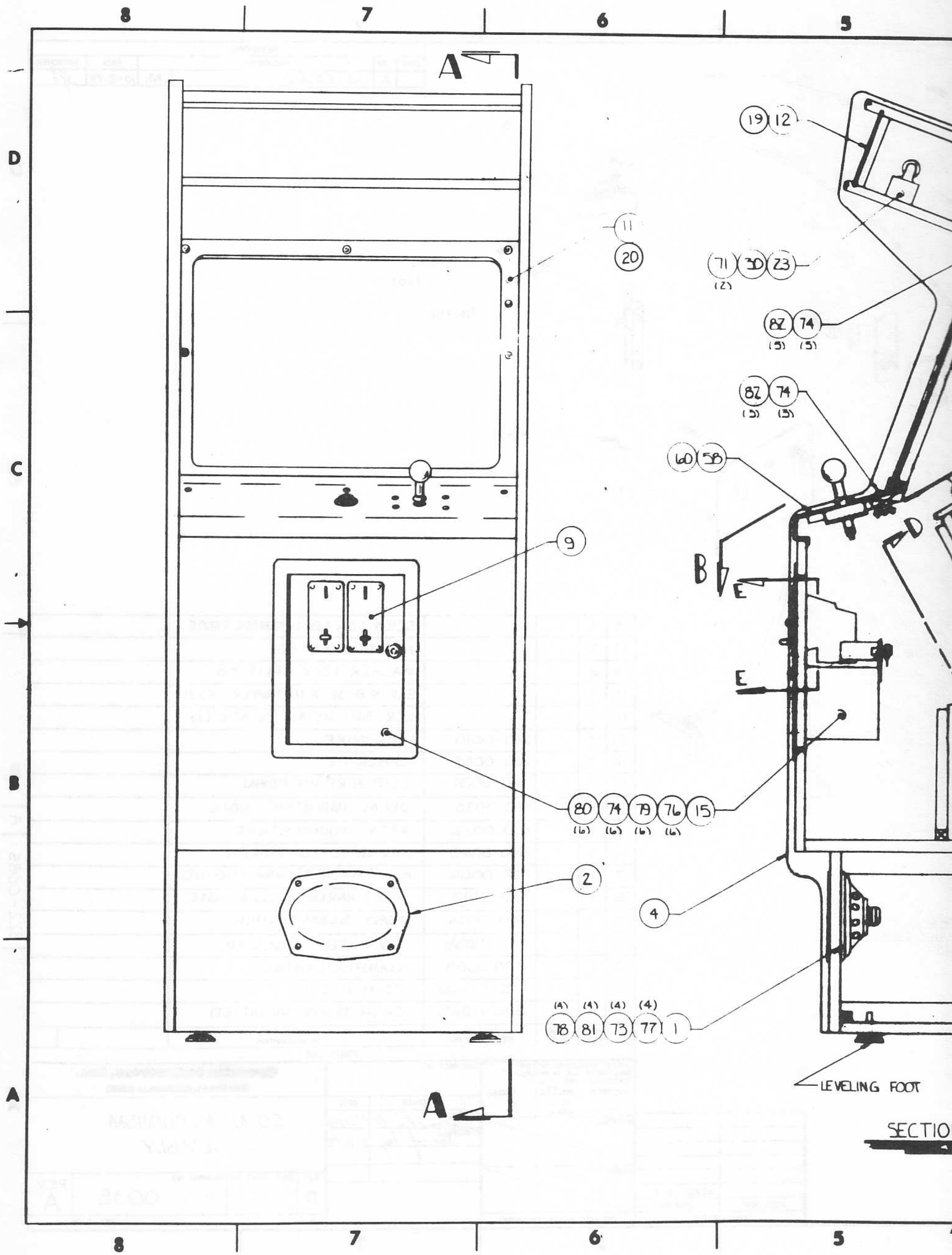
SIZE	CODE IDENT NO.	DRAWING NO.	
D		722-0013	A

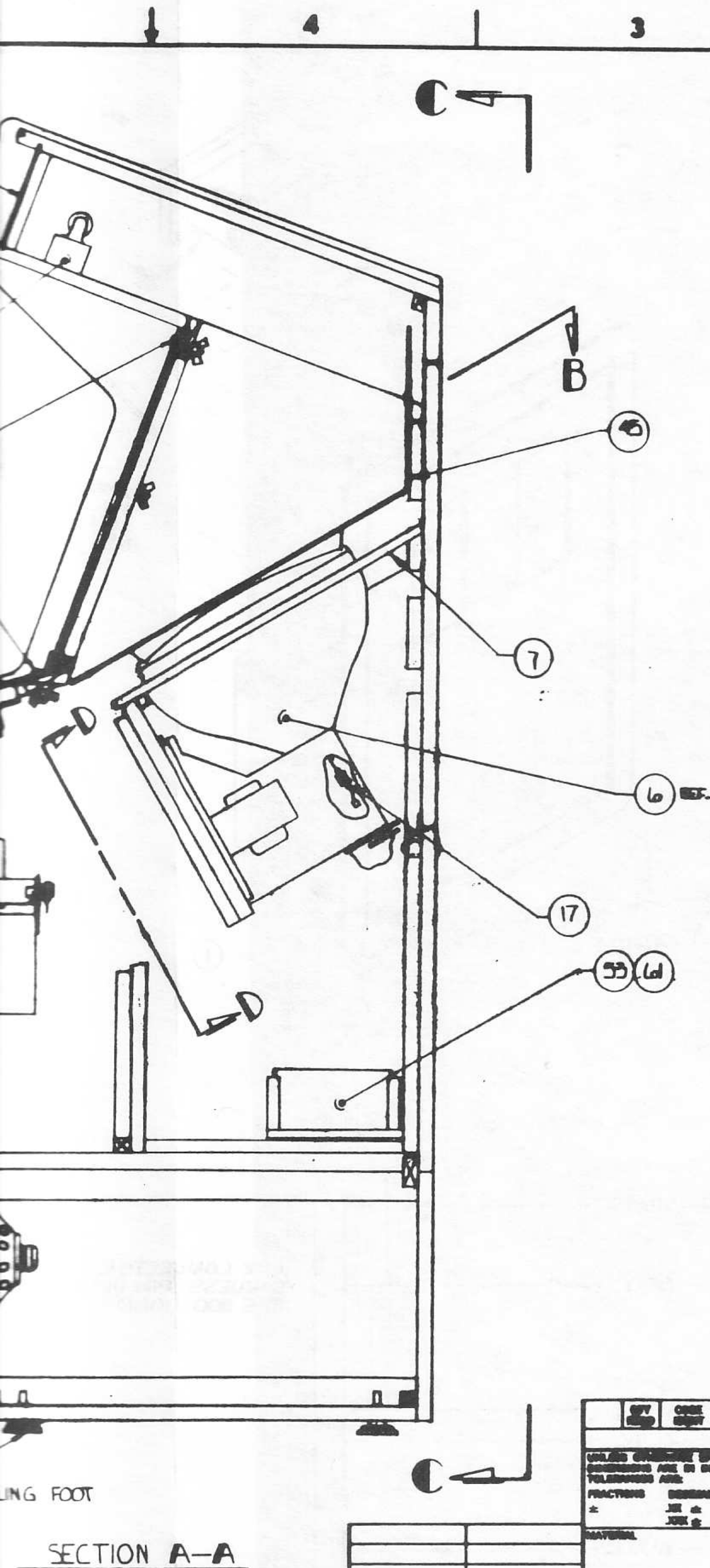
SCALE — SHEET 8 OF 9

NEXT ASSY	USED ON

APPLICATION

DO NOT SCALE DRAWING


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LEVELING FOOT
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ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED		

PARTS LIST

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

NEXT ASSY | USED ON

APPLICATION

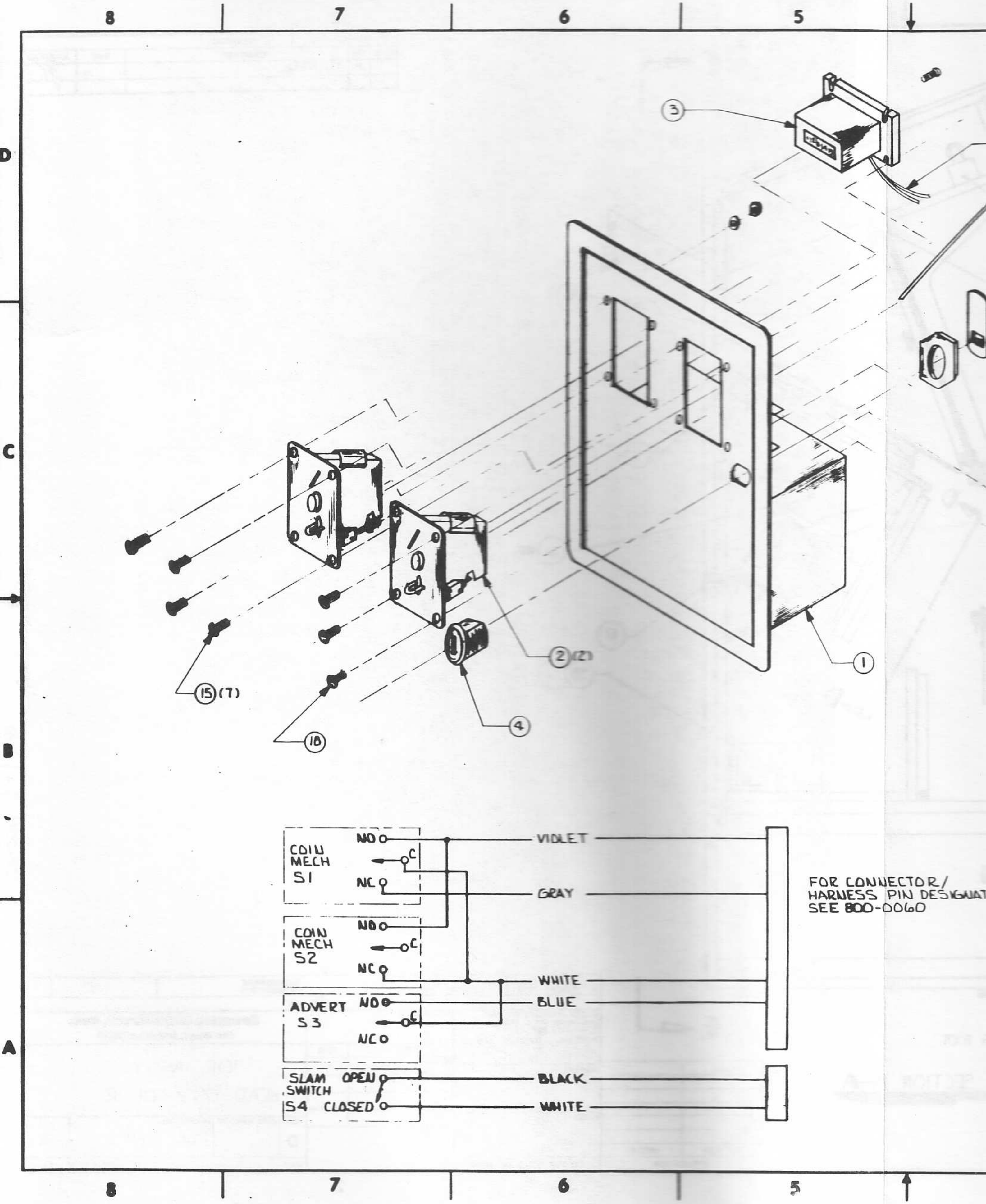
APPROVALS | DATE 9/24/79

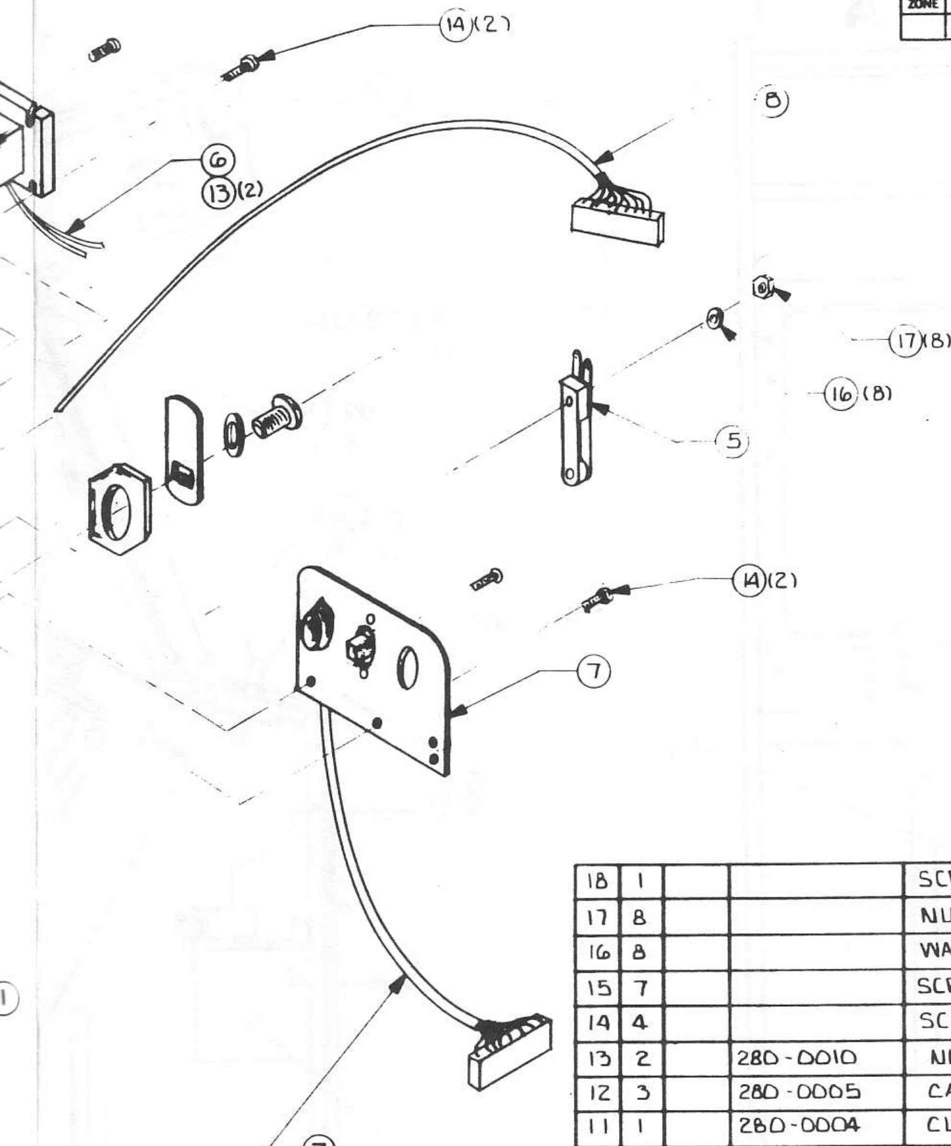
Gremlin Industries, Inc.
San Diego, California

TOP ASSY
HEAD ON 2 COLOR

SIZE D | CODE IDENT NO. | DRAWING NO 722 0013 | A

SCALE | SHEET OF


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15 (7)
18
COIN MECH S1
NO
C
NC
VIOLET
GRAY
COIN MECH S2
NO
C
NC
WHITE
ADVERT S3
NO
C
NC
BLUE
SLAM SWITCH S4
OPEN
CLOSED
BLACK
WHITE
FOR CONNECTOR/
HARNESS PIN DESIGNAT
SEE 800-0060



ONNECTOR/
SS PIN DESIGNATIONS
0-0060

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED S.M.	10-2-79	

FIND NO.	QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
18	1			SCR 8-32 X 1.0 LG TAMPER PROOF
17	8			NUT HEX #8-32
16	8			WASHER LOCK SPLIT #8
15	7			SCR #8-32 X 1/2 TAMPER PROOF
14	4			SCR SHT METAL #6 X 1/2 LG
13	2		280-0010	NUT WIRE
12	3		280-0005	CABLE TIE
11	1		280-0004	CLIP WIRE HOLDOWN
10	1		420-0038	DECAL IMPORTANT NOTE
9	1		800-0026	ASSY GROUND STRAP
8	1		800-0060	HARNESS COIN MECH
7	1		822-0006	ASS'Y HARNESS PWR / SOUND
6	1		822-0010	ASSY HARNESS COIN CNTR
5	1		800-0051	ASS'Y SLAM SWITCH
4	1		220-0035	LOCK FORT LOCK IR
3	1		220-0008	COUNTER DIGITAL
2	2		220-0066	COIN MECH
1	1		250-0285	CASH DOOR MODIFIED

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

NEXT ASSY	USED ON
	HEAD ON 2

APPLICATION

CONTRACT NO.

APPROVALS	DATE
DRAWN	9/27/79
CHECKED	10-2-79

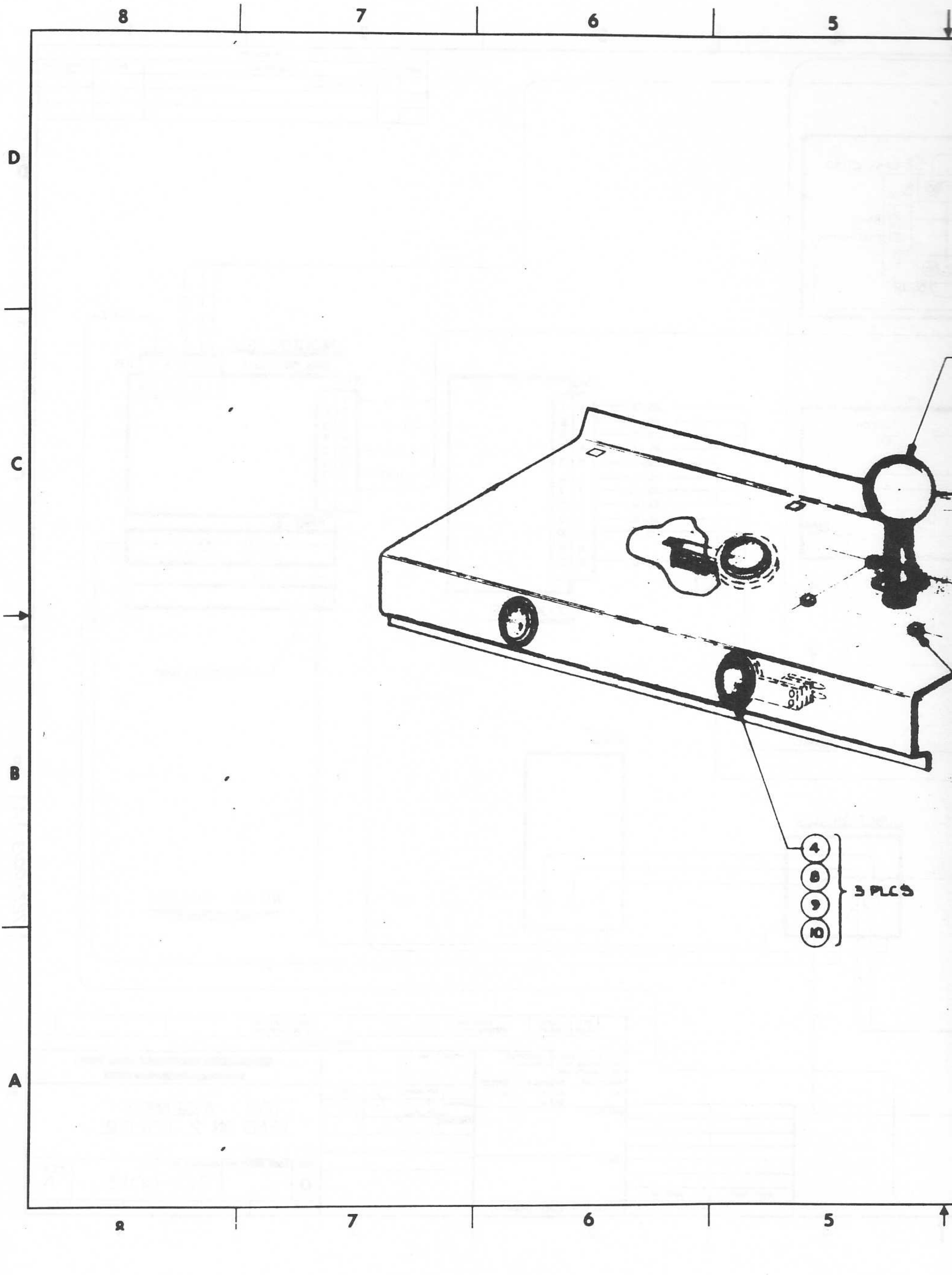
Gremlin Industries, Inc.
San Diego, California

COIN MECHANISM ASSEMBLY

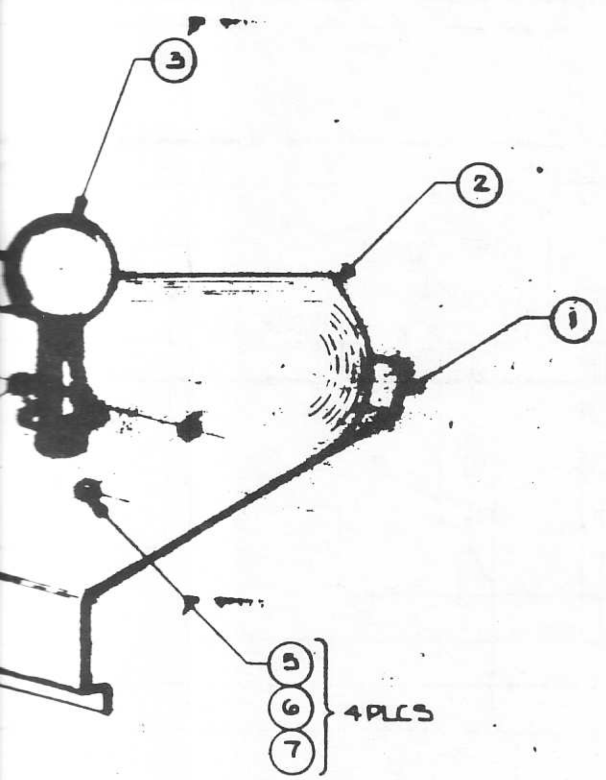
SIZE D | CODE IDENT NO. | DRAWING NO. 822-0035 | REV. A

SCALE | SHEET 1 OF 1

822-0035 A


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3 PLCS

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED S.M.	10-2-79	



3 PLCS

ITEM NO	QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION		
10	6		253-0031	SPACER WICO SWITCH		
9	3		240-0007	BUTTON PLUNGER BLACK		
8	3			PAL NUT 1/2 X 13		
7	4			NUT HEX #10-32		
6	4			WASHER LOCK SPLIT #10		
5	4			CARRIGE BOLT #10-32 X 3/4		
4	3		510-0023	SWITCH WICO		
3	1		800-0036	ASS'Y JOYSTICK		
2	1		253-0106	CONTROL PANEL GRAPHIC		
1	1		250-0365	CONTROL PANEL METAL		

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

NEXT ASSY	USED ON
722-0013	HEAD ON II

APPLICATION

CONTRACT NO.

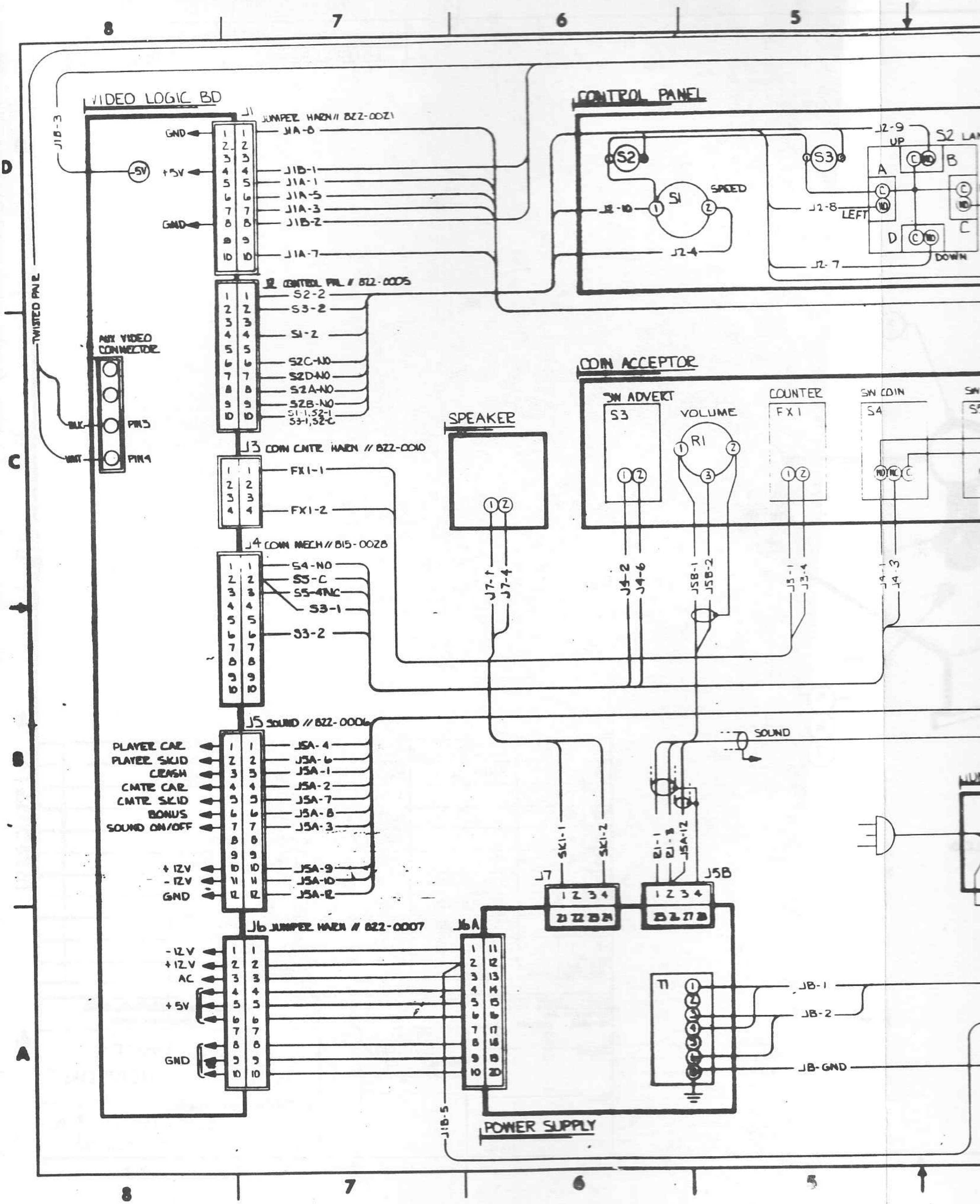
APPROVALS		DATE
DRAWN	S MAGNOLIA	9-24-79
CHECKED	[signature]	10-2-79

Gremlin Industries, Inc.
San Diego, California

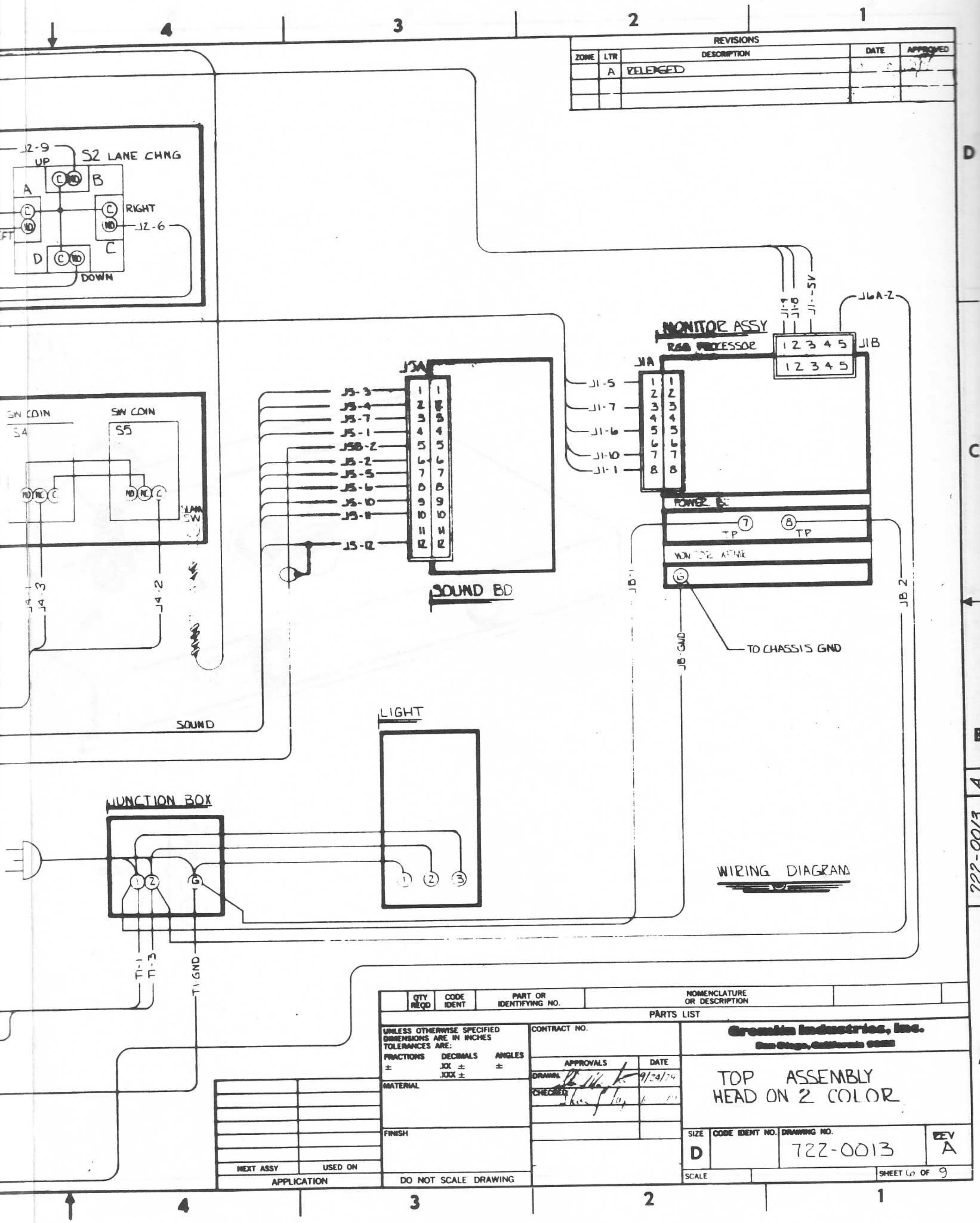
CONTROL PANEL ASSEMBLY HEAD-ON 2

SIZE	CODE IDENT NO	DRAWING NO	
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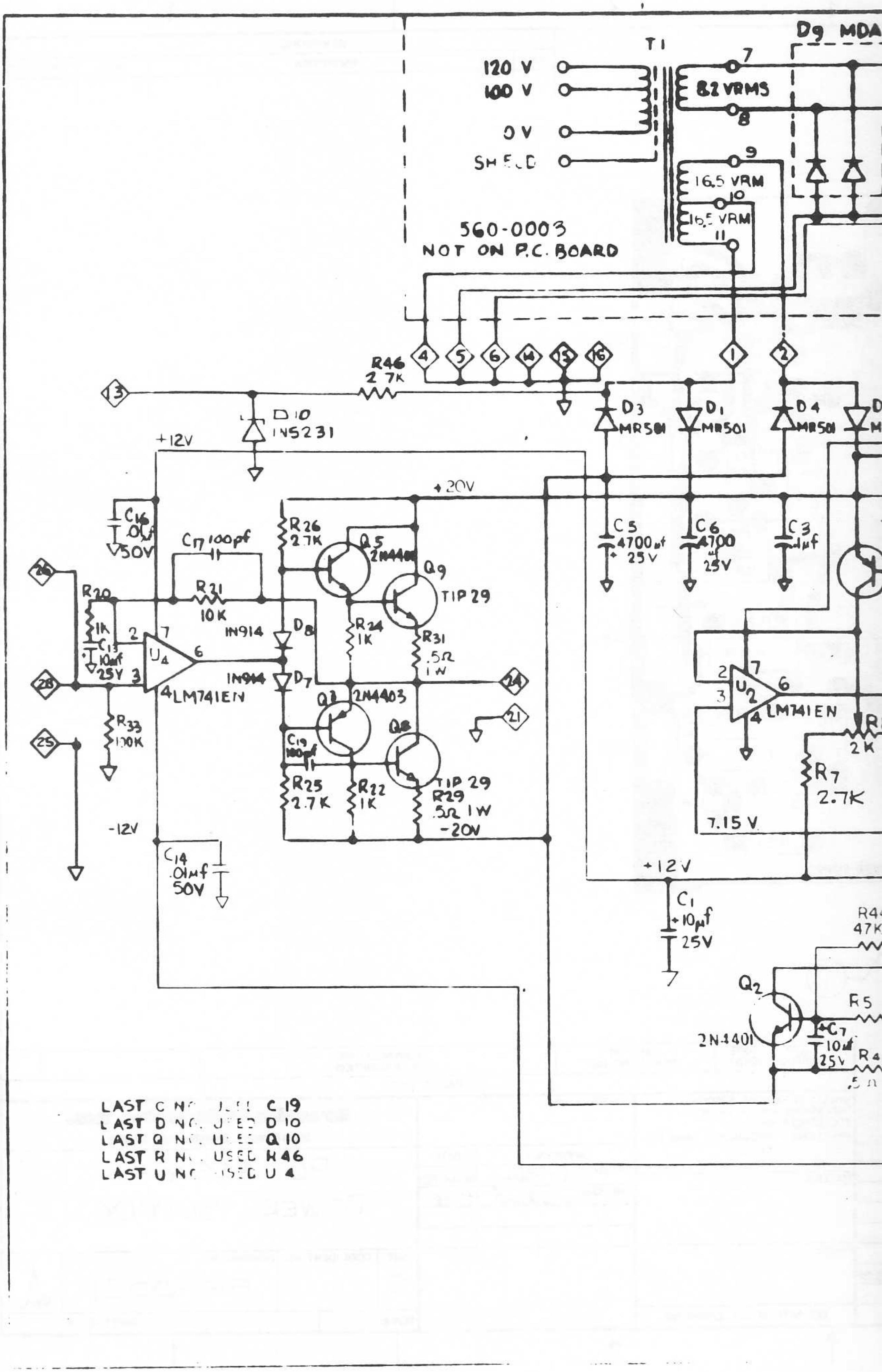
SCALE — SHEET 1 OF 1

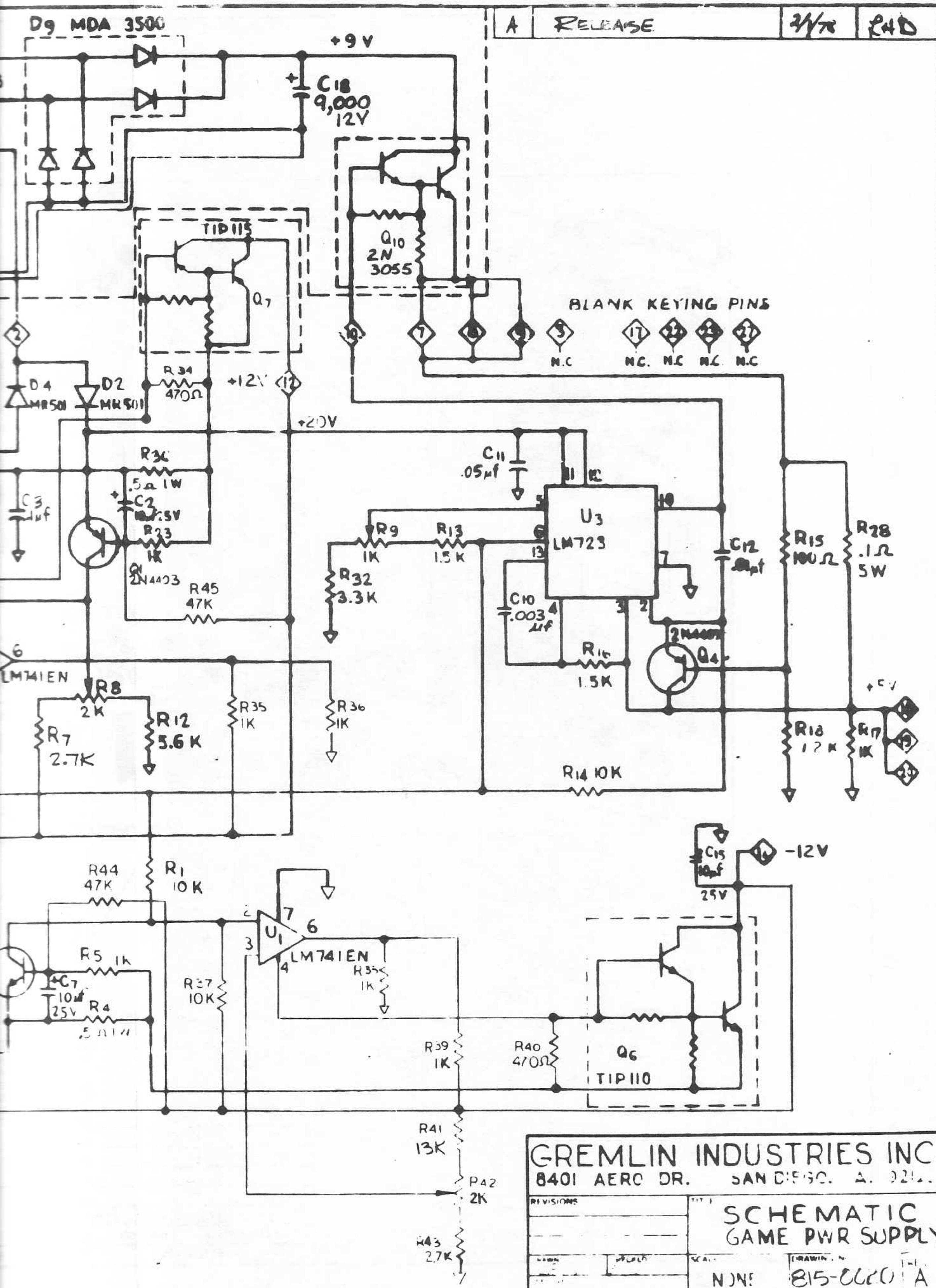


VIDEO LOGIC BD
J1 JUMPER HARN // 822-0021
GND
+5V
J1A-8
J1B-1
J1A-1
J1A-5
J1A-3
J1B-2
J1A-7
J1B-3
TWISTED PAIR
AUX VIDEO CONNECTOR
BLK
WHT
PIN3
PIN4
J2 CONTROL PNL // 822-0005
S2-2
S3-2
S1-2
S2C-NO
S2D-NO
S2A-NO
S2B-NO
S1-1, S2-1
S3-1, S2-C
J3 COIN CNTR HARN // 822-0010
FX1-1
FX1-2
J4 COIN MECH // 815-0028
S4-NO
S5-C
S5-4NC
S3-1
S3-2
J5 SOUND // 822-0006
PLAYER CAR
PLAYER SKID
CRASH
CMTR CAR
CMTR SKID
BONUS
SOUND ON/OFF
+12V
-12V
GND
J5A-4
J5A-6
J5A-1
J5A-2
J5A-7
J5A-8
J5A-3
J5A-9
J5A-10
J5A-12
J6 JUMPER HARN // 822-0007
J6A
-12V
+12V
AC
+5V
GND
CONTROL PANEL
J2-9
UP
S2
S3
S1
SPEED
J2-10
J2-8
LEFT
J2-4
J2-7
DOWN
A
B
C
D
COIN ACCEPTOR
SW ADVERT
S3
VOLUME
R1
COUNTER
FX1
SW COIN
S4
SPEAKER
J7-1
J7-4
J4-2
J4-6
J5B-1
J5B-2
J3-1
J3-4
J4-1
J4-3
SOUND
SK1-1
SK1-2
E1-1
E1-3
J5A-12
J7
J5B
T1
JB-1
JB-2
JB-GND
J1B-5
POWER SUPPLY
8
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REVISIONS
ZONE | LTR | DESCRIPTION | DATE | APPROVED
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S2 LANE CHNG
J2-9
UP
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J2-6
DOWN
SW COIN S4
SW COIN S5
J4-3
J4-2
SOUND
J5A
J5-3
J5-4
J5-7
J5-1
J5B-2
J5-2
J5-5
J5-6
J5-10
J5-11
J5-12
SOUND BD
MONITOR ASSY
RGB PROCESSOR
J1A
J1B
J1-5
J1-7
J1-6
J1-10
J1-1
J1-9
J1-8
J1-5V
J6A-2
POWER
TP
MONITOR
JB-1
JB 2
JB GND
TO CHASSIS GND
LIGHT
JUNCTION BOX
T1-1
T1-3
T1 GND
WIRING DIAGRAM
QTY REQD | CODE IDENT | PART OR IDENTIFYING NO. | NOMENCLATURE OR DESCRIPTION
PARTS LIST
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±
MATERIAL
FINISH
CONTRACT NO.
APPROVALS DATE
DRAWN 9/24/74
CHECKED
Gremlin Industries, Inc.
San Diego, California
TOP ASSEMBLY
HEAD ON 2 COLOR
SIZE D
CODE IDENT NO.
DRAWING NO. 722-0013
REV A
SCALE
SHEET 6 OF 9
NEXT ASSY
USED ON
APPLICATION
DO NOT SCALE DRAWING
722-0013 A


D9 MDA
T1
120 V
100 V
0 V
8.2 VRMS
16.5 VRM
16.5 VRM
560-0003
NOT ON P.C. BOARD
R46
2.7K
D10
1N5231
+12V
D3
MR501
D1
MR501
D4
MR501
+20V
C16
.01µf
50V
C17 100pf
R26
2.7K
Q5
Q9
TIP 29
R20
1K
R21
10K
1N914
D8
R24
1K
R31
.5Ω
1W
C13
10µf
25V
U4
LM741EN
1N914
D7
Q7
2N4403
Q8
R33
100K
C19
100pf
R25
2.7K
R22
1K
TIP 29
R29
.5Ω 1W
-20V
-12V
C14
.01µf
50V
C5
4700µf
25V
C6
4700µf
25V
C3
.1µf
U2
LM741EN
2K
R7
2.7K
7.15 V
+12V
C1
10µf
25V
R44
47K
Q2
2N4401
R5
C7
10µf
25V
R4
LAST C NO. USED C19
LAST D NO. USED D10
LAST Q NO. USED Q10
LAST R NO. USED R46
LAST U NO. USED U4



GREMLIN INDUSTRIES INC.
8401 AERO DR. SAN DIEGO, CA. 921..

SCHEMATIC
GAME PWR SUPPLY

SCALE: NONE
DRAWING NO. 815-0020 A

SHEET 4

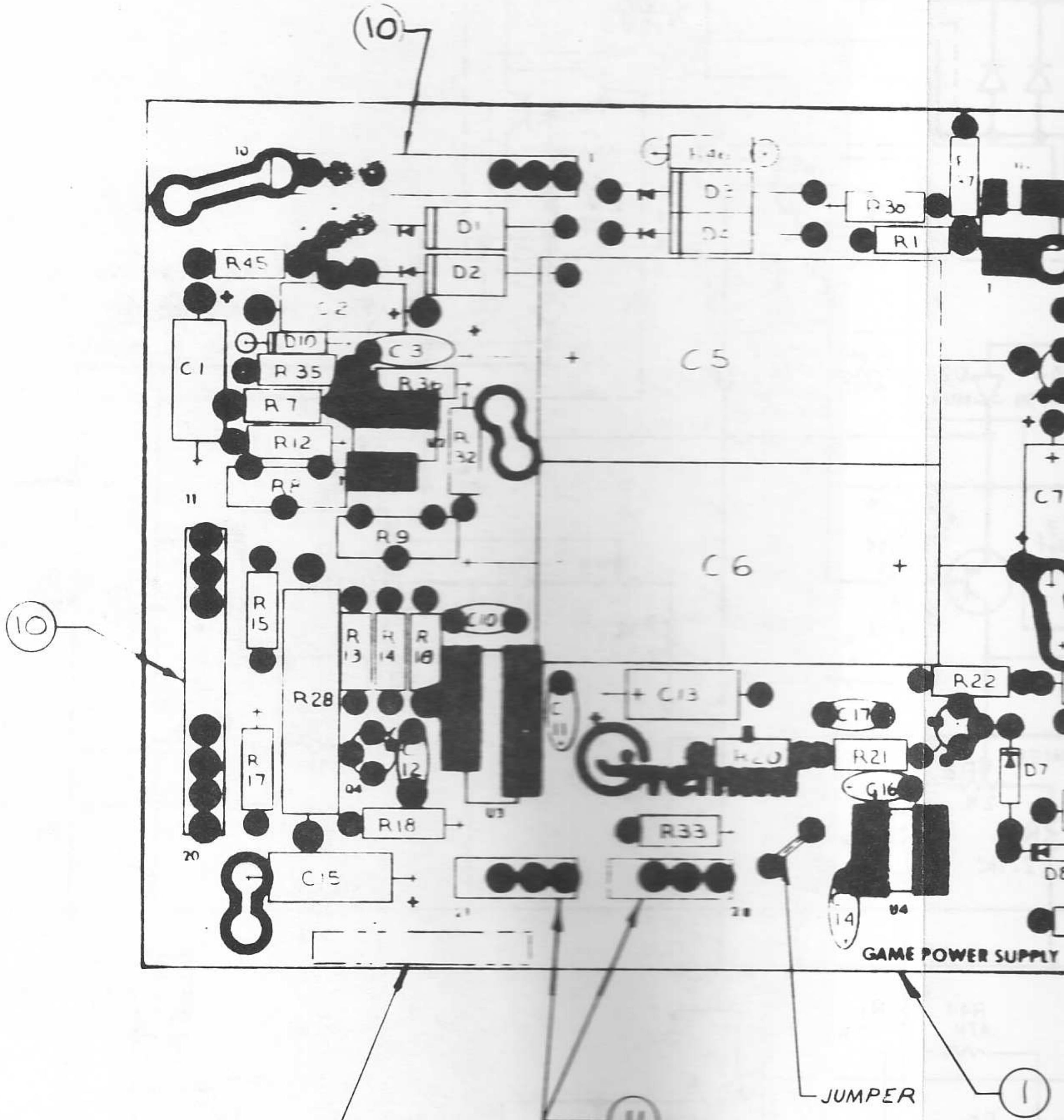
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— REIDENTIFY ASSY
WITH No. 815-0021
& LATEST REV

815-0020	PWR Sply Assy
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APPLICATION	

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TOLERANC...
FRACTIONS
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FINISH

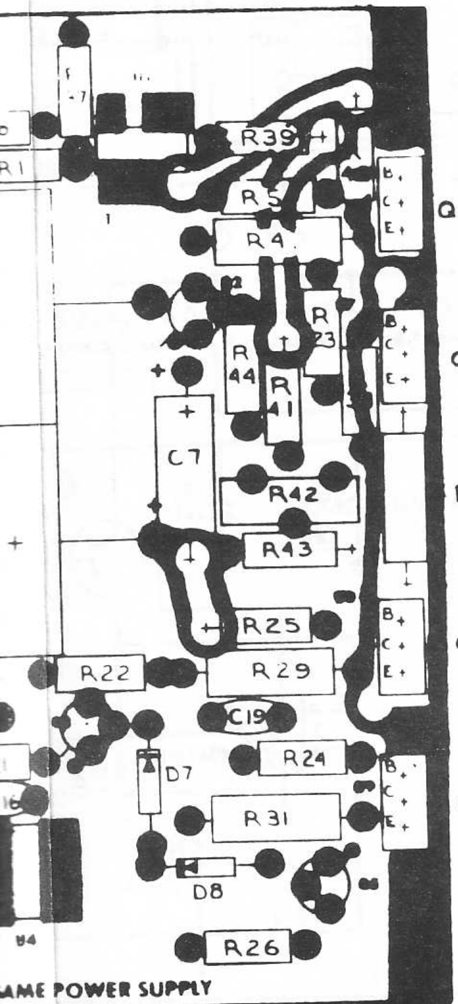
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ZONE	LTR	REVISIONS DESCRIPTION	DATE	APPROVED

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	QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION		

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

CONTRACT NO.

APPROVALS		DATE
DRAWN	K. LE BLANC	16JAN78
CHECKED	[signature]	2/1/78

Gremlin Industries, Inc.
San Diego, California 92123

PC ASSY - POWER SUPPLY

A

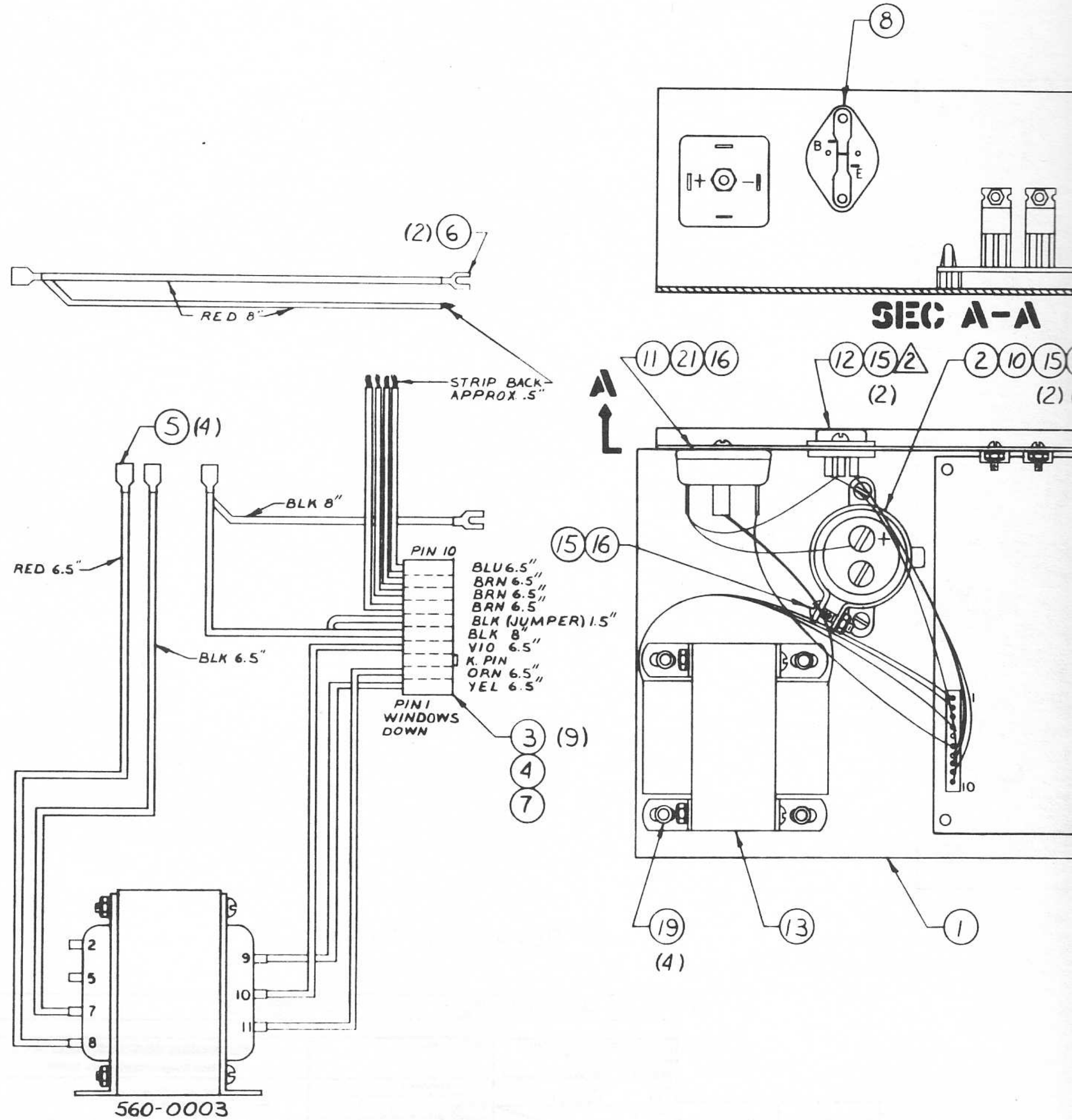
SIZE	CODE IDENT NO.	DRAWING NO.	REV
C		815-0021	A

SCALE SHEET 4 OF

PWR Sply Assy
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DO NOT SCALE DRAWING

2 1

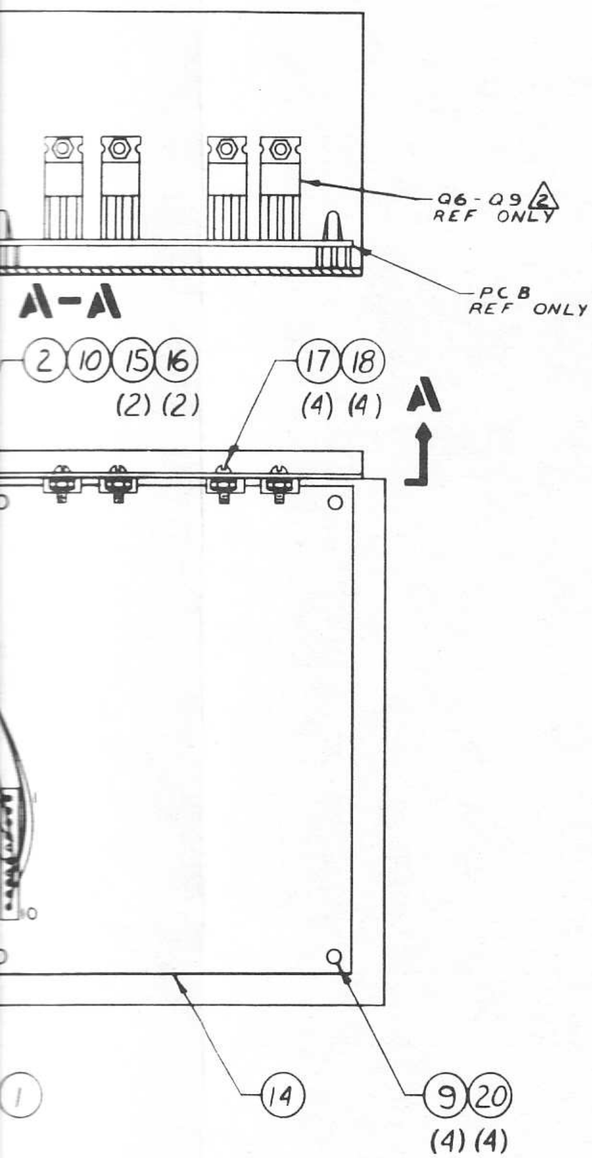


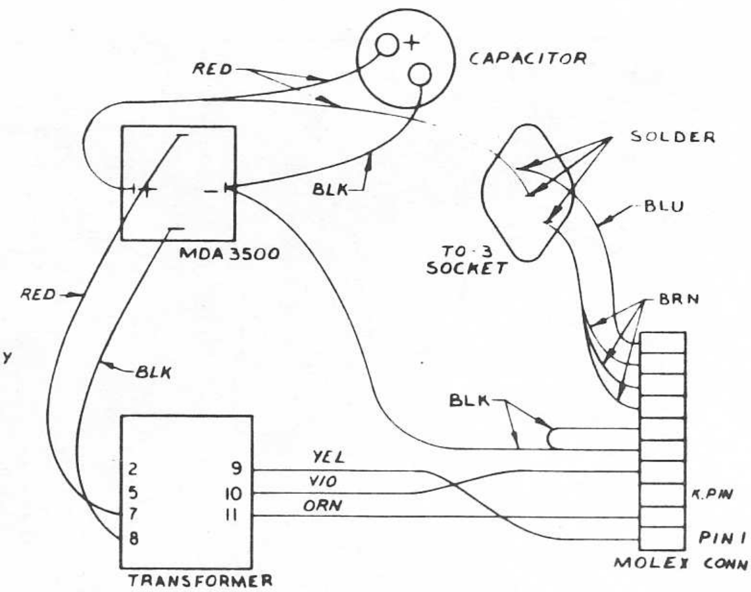
NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL WIRE TO BE AWG #22 GA

2. ALL POWER TRANSISTORS TO BE MOUNTED WITH HEAT SINKING PASTE & INSULATING HARDWARE

ZONE	LTR	REVISIONS DESCRIPTION	DATE	APPROVED





WIRING DIAGRAM

SEE DETACHED PARTS LIST 815-0020

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

CONTRACT NO.

APPROVALS	DATE
DRAWN Lee J Liprek	
CHECKED	

Gremlin Industries, Inc.
San Diego, California 92123

ASSY
POWER SUPPLY

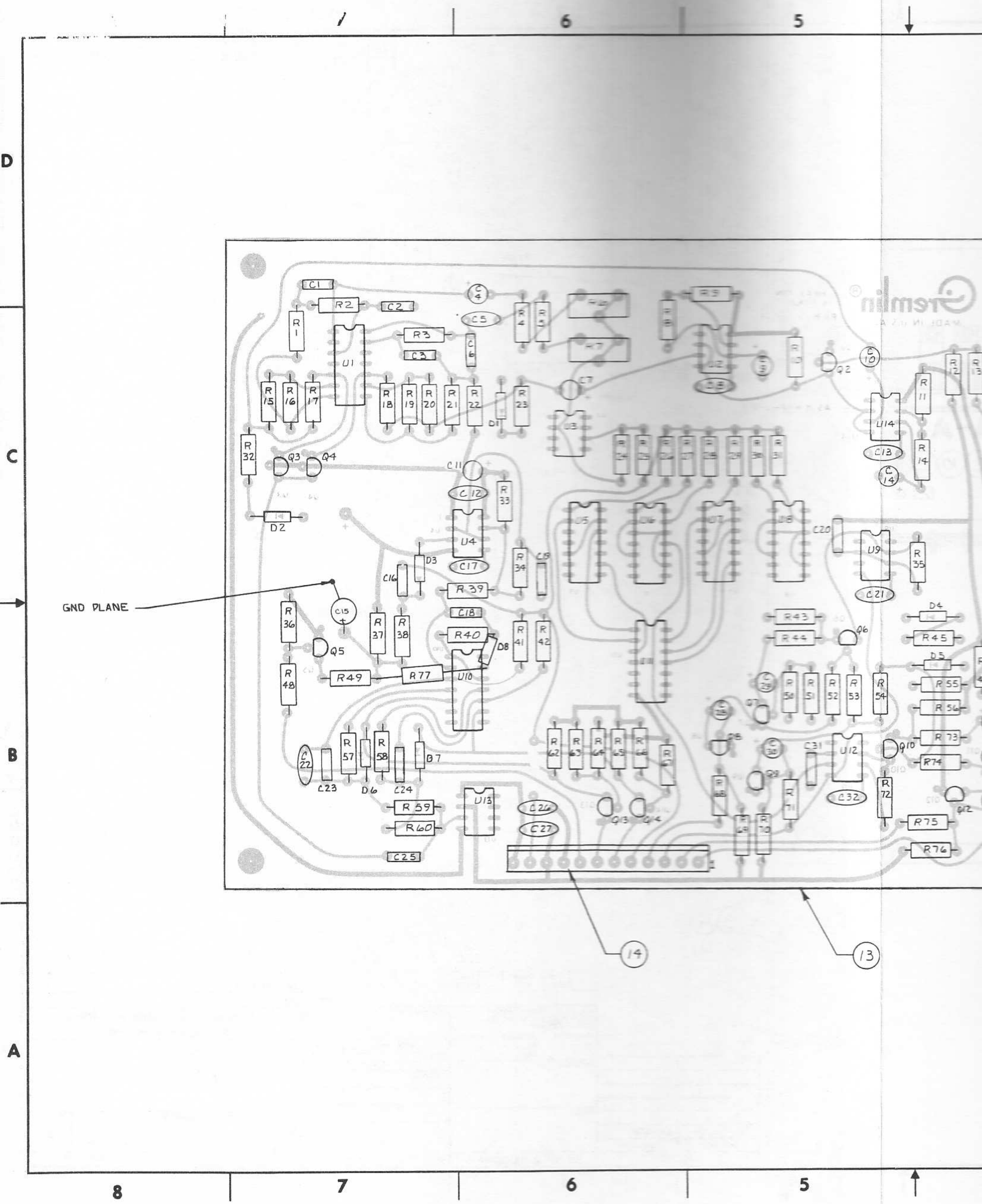
SIZE	CODE IDENT NO.	DRAWING NO.	REV
D		815-0020	A

SCALE FULL — SHEET 3 OF 4

NEXT ASSY	USED ON
715-0001	SAFARI

APPLICATION

DO NOT SCALE DRAWING



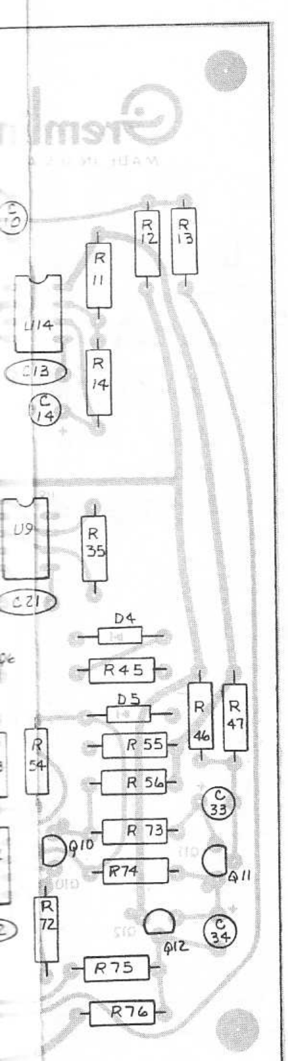
7
6
5
D
C
B
A
8
GND PLANE
Gremlin
MADE IN U.S.A.
C1
C2
C3
C4
C5
C6
C7
C8
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
C23
C24
C25
C26
C27
C28
C29
C30
C31
C32
R1
R2
R3
R4
R5
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
R19
R20
R21
R22
R23
R32
R33
R34
R35
R36
R37
R38
R39
R40
R41
R42
R43
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R45
R48
R49
R50
R51
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R56
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R58
R59
R60
R62
R63
R64
R65
R66
R67
R68
R69
R70
R71
R72
R73
R74
R75
R76
R77
U1
U2
U3
U4
U5
U6
U7
U8
U9
U10
U11
U12
U13
U14
D1
D2
D3
D4
D5
D6
D7
D8
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q12
Q13
Q14
1
14
13

4	3	2	1

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED	1-8-79	
	B	ECN 273 1-25-79 ADDENDUM 273	1-25-79	

D



C

B

822-0002 B

SEE DETACHED PARTS LIST

13

QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION		

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS		DATE
DRAWN	Wynema	11-10-78
CHECKED	Steve f. Fay	12-22-78

Gremlin Industries, Inc.
San Diego, California 92123

PC ASSEMBLY
HEAD ON SOUND

SIZE	CODE IDENT NO.	DRAWING NO.	REV
D		822-0002	B

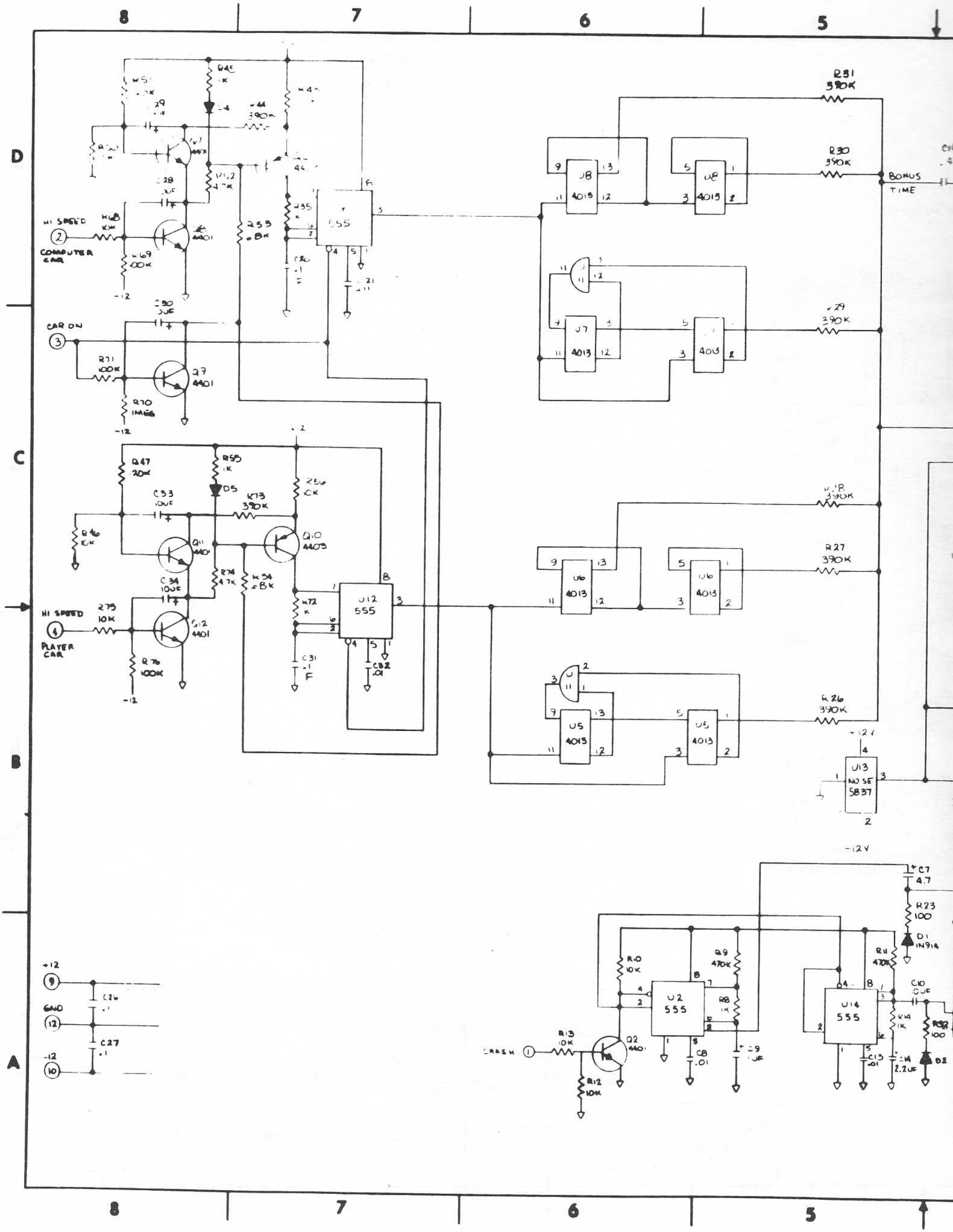
SCALE 2/1 SHEET 5 OF 6

NEXT ASSY	USED ON
722-0001	HEAD ON

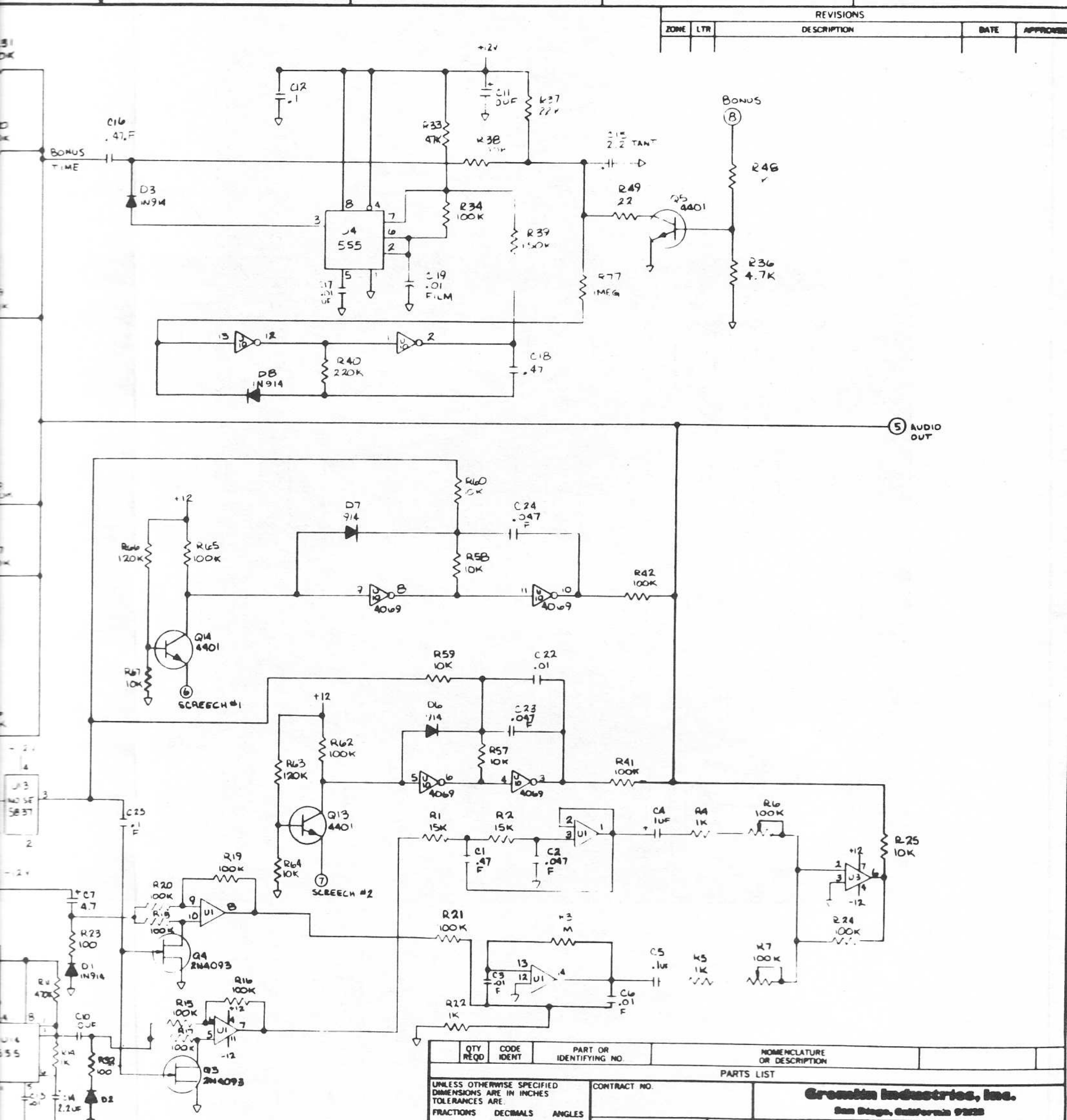
APPLICATION

A

4	3	2	1



8
7
6
5
D
C
B
A
R45 1K
R44 390K
R59 6.8K
555
R31 390K
R30 390K
BONUS TIME
4013
R29 390K
HI SPEED
COMPUTER CAR
R68 10K
R69 100K
4401
C30 10UF
CAR ON
R71 100K
R70 100K
Q7 4401
R47 10K
R55 1K
D5
C33 10UF
R73 390K
R56 10K
R46 10K
Q11 4401
Q10 4403
R28 390K
R27 390K
C34 10UF
R74 4.7K
R54 6.8K
R72 1K
U12 555
HI SPEED
R75 10K
PLAYER CAR
Q12 4401
R76 100K
C31 .1
C32 .01
R26 390K
U13 NOISE 5837
+12V
-12V
C7 4.7
R23 100
D1 1N914
+12
C26 .1
GND
C27 .1
-12
R10 10K
R9 470K
U2 555
R8 1K
R11 470K
U14 555
C10 10UF
R14 1K
R32 100
CRASH
R13 10K
Q2 4401
R12 10K
C8 .01
C9 1UF
C13 .01
C14 2.2UF
D2



QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS XX ± XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN	11-6 78
CHECKED	12 22 78

Gremlin Industries, Inc.
San Diego, California 92123

SCHEMATIC
HEAD ON SOUND BD.

SIZE	CODE IDENT NO	DRAWING NO	REV.
D		822-0002	B

SCALE — SHEET 6 OF 6

NEXT ASSY	USED ON
722-0001	HEAD ON

APPLICATION

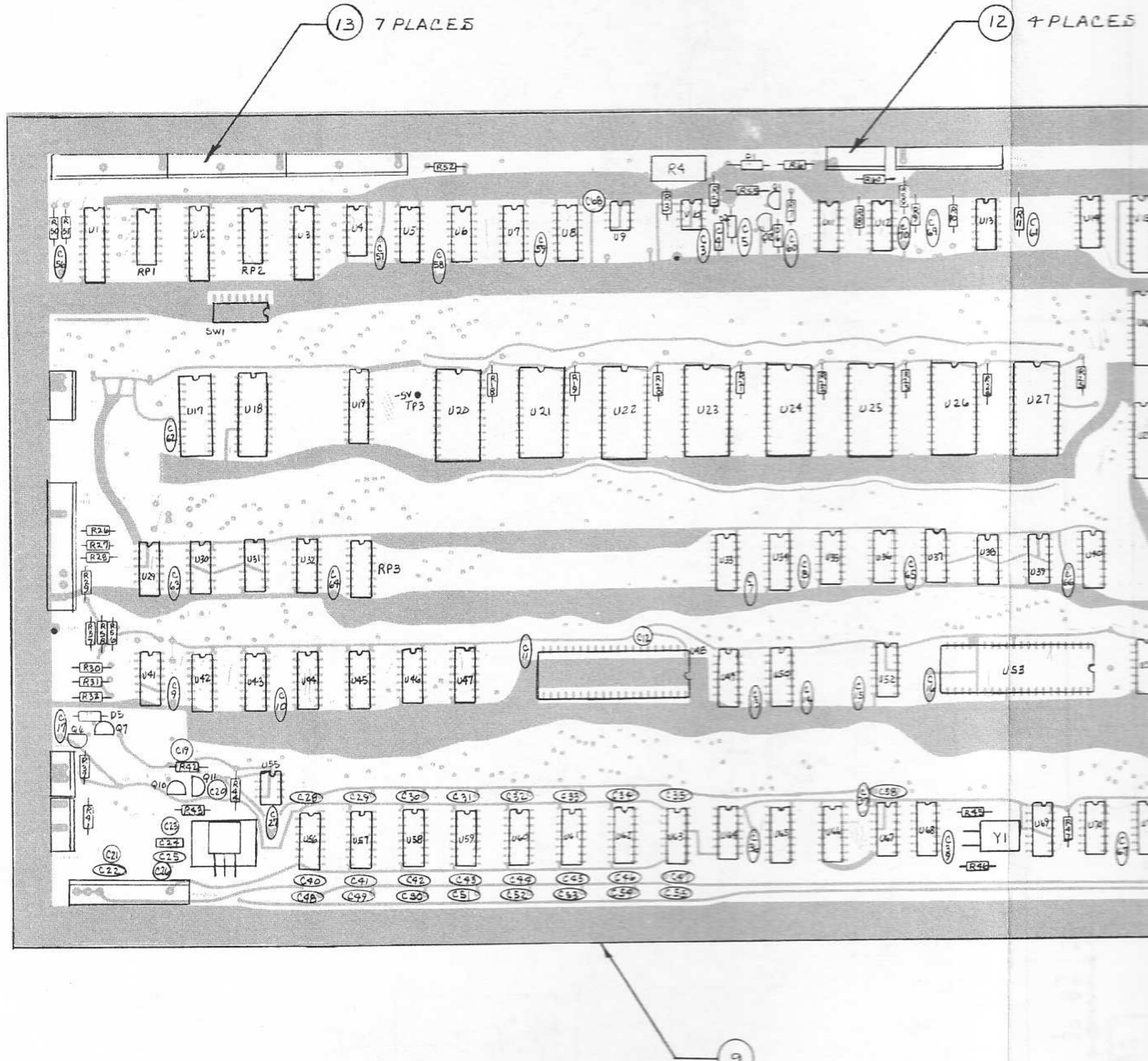
8	7	6	5

D

C

B

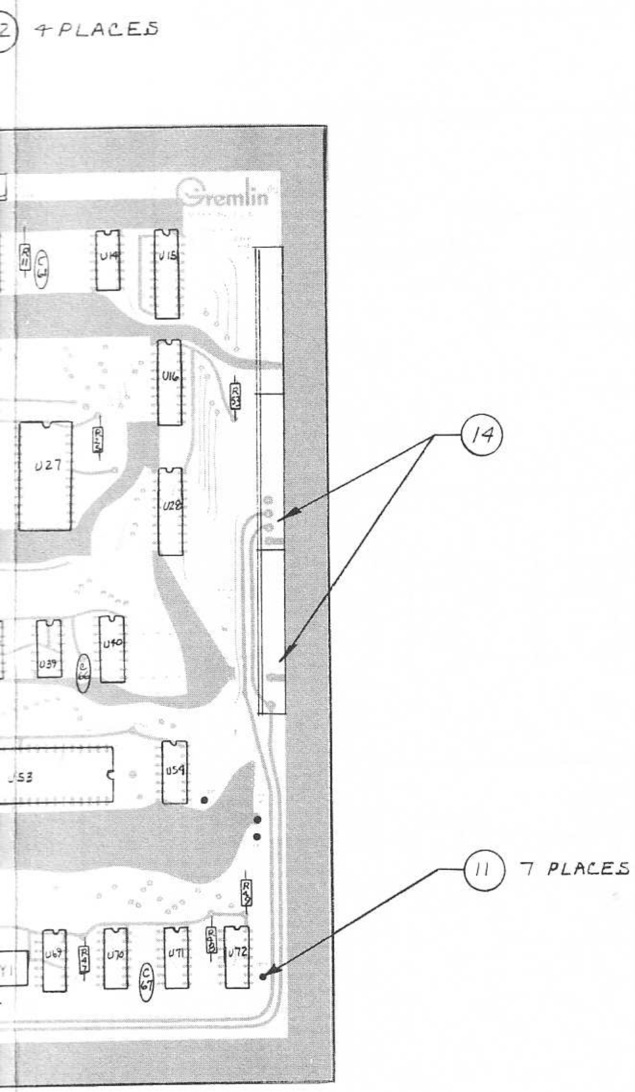
A



8	7	6	5

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	RELEASED	12-22-78	
	B	PER ECN 310	3-29-79	
	C	PER ECN 318 & 321	8-8-79	

REVISIONS



SEE DETACTED PARTS LIST

	QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION		

PARTS LIST

NEXT ASSY	USED ON
826-0004	
814-0019	
822-0011	
822-0001	

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

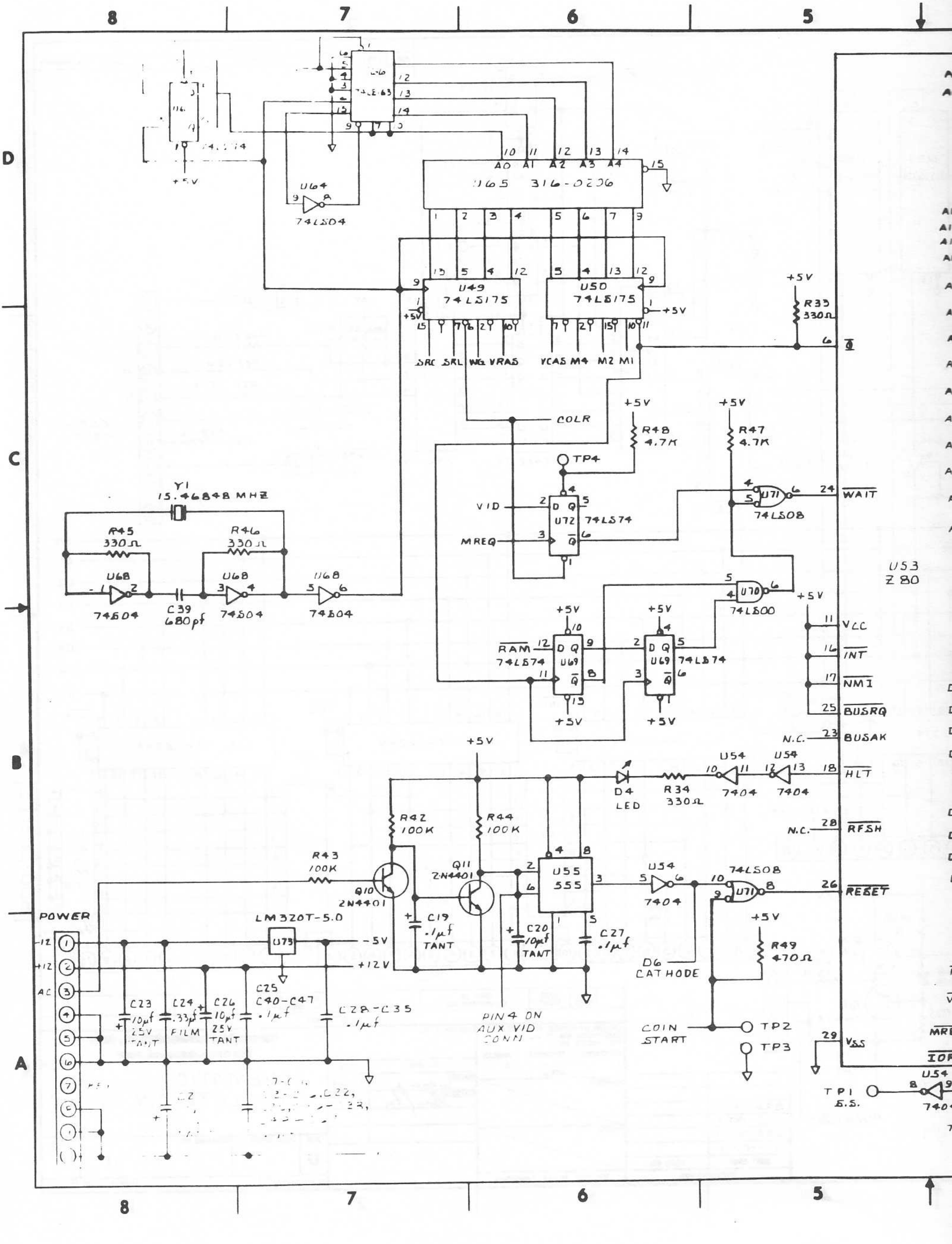
APPROVALS		DATE
DRAWN	Wynema	11-20-78
CHECKED		12-22-78

ASSEMBLY —
BASIC V.I.C. BOARD

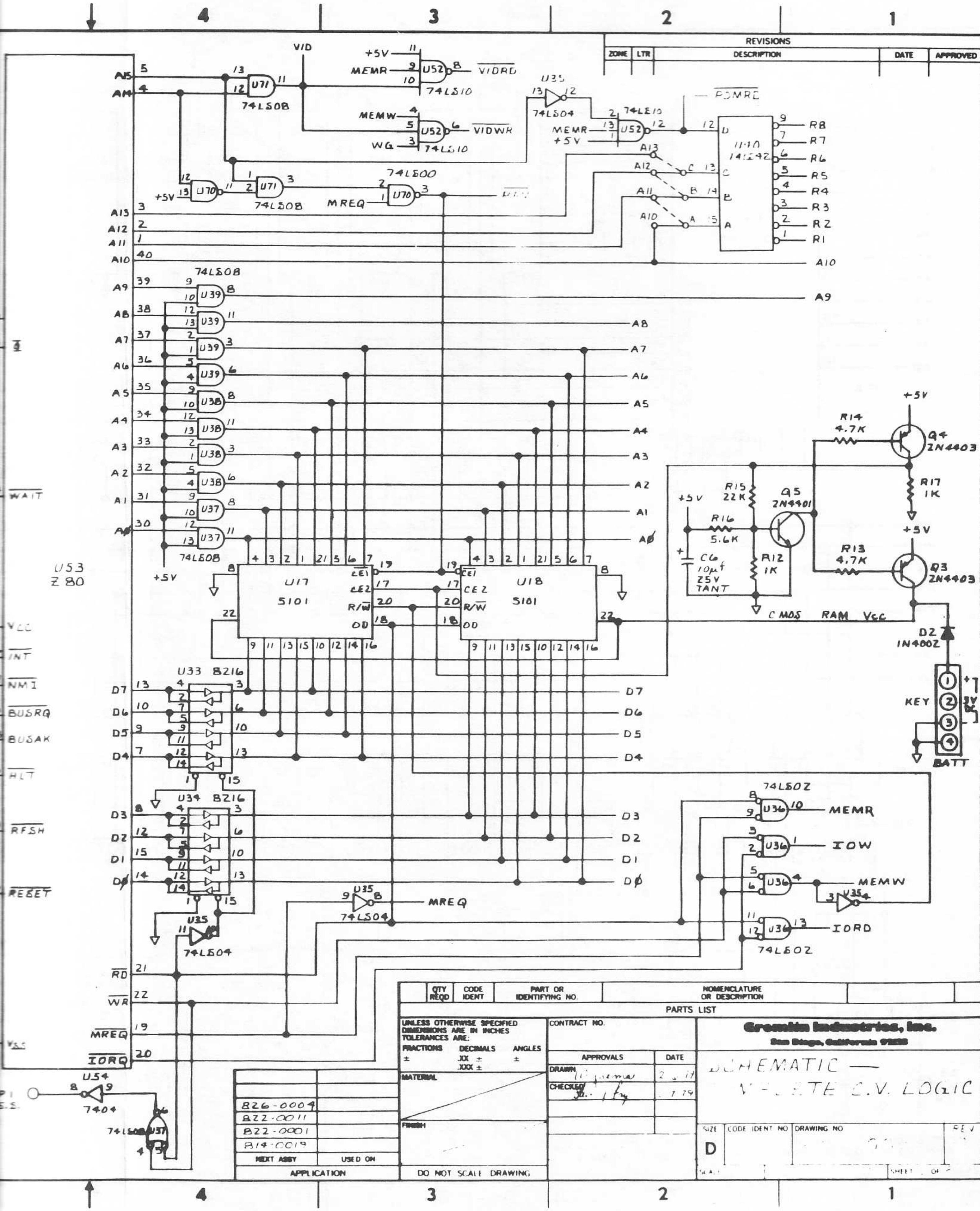
SIZE	CODE IDENT NO.	DRAWING NO.	REV
D		830-0031	C

SCALE 1/1 SHEET 3 OF 3

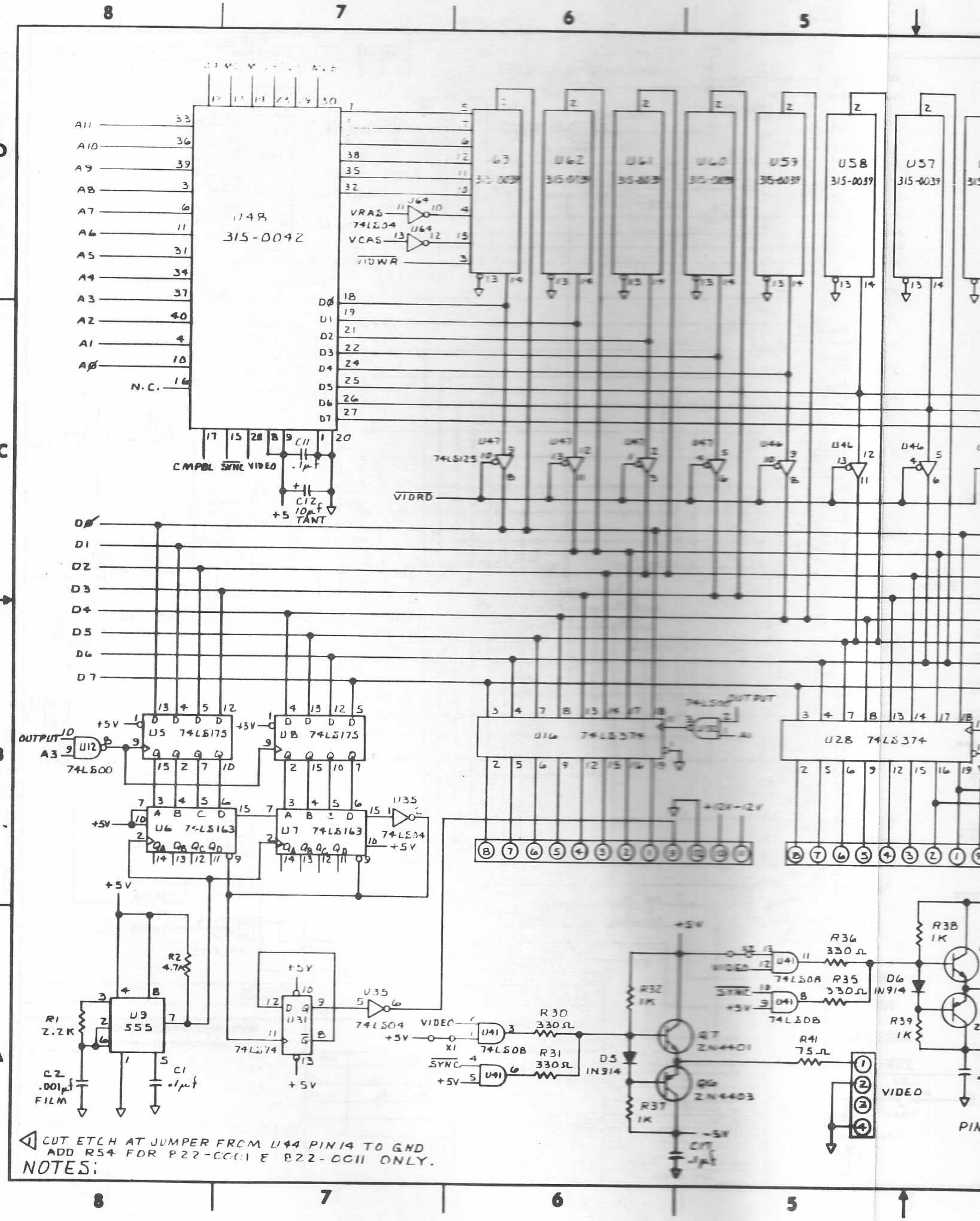
830-0031 C



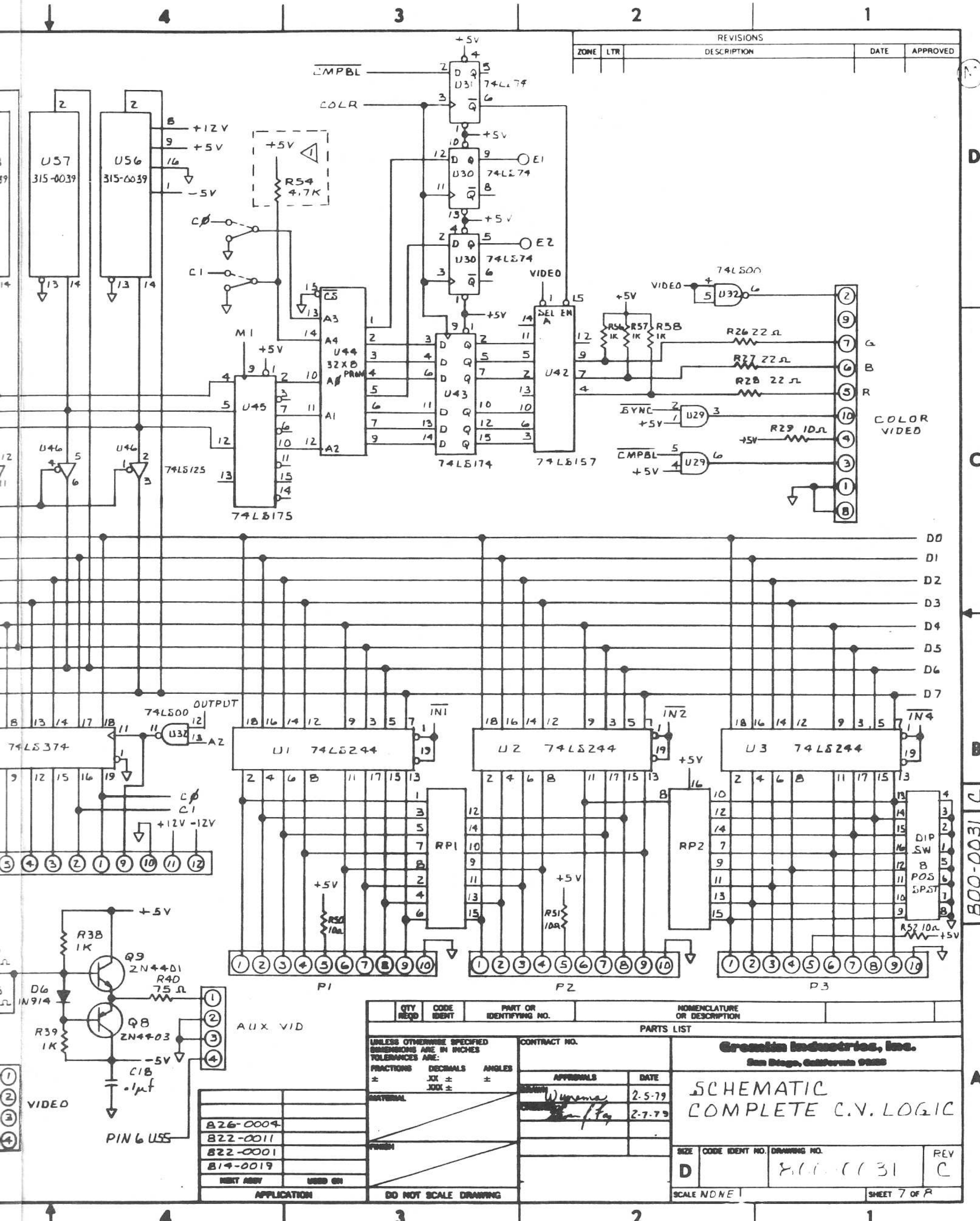
8
7
6
5
D
C
B
A
74LS74
+5V
U64
74LS04
U65 316-0206
A0 A1 A2 A3 A4
U49
74LS175
U50
74LS175
SRC SRL WG VRAS
VCAS M4 M2 M1
COLR
R33
330Ω
R48
4.7K
R47
4.7K
TP4
VID
MREQ
U72
74LS74
U71
74LS08
WAIT
Y1
15.46848 MHZ
R45
330Ω
R46
330Ω
U68
74S04
C39
680pf
U70
74LS00
RAM
U69
74LS74
U53
Z 80
VCC
INT
NMI
BUSRQ
N.C.
BUSAK
HLT
RFSH
REBET
VSS
U54
7404
D4
LED
R34
330Ω
R42
100K
R44
100K
R43
100K
Q10
2N4401
Q11
2N4401
U55
555
C19
.1μf
TANT
C20
10μf
TANT
C27
.1μf
D6
CATHODE
R49
470Ω
POWER
LM320T-5.0
U73
-5V
+12V
-12
+12
AC
C23
10μf
25V
TANT
C24
.33μf
FILM
C26
10μf
25V
TANT
C25
C40-C47
.1μf
C28-C35
.1μf
PIN 4 ON
AUX VID
CONN
COIN
START
TP2
TP3
TP1
S.S.



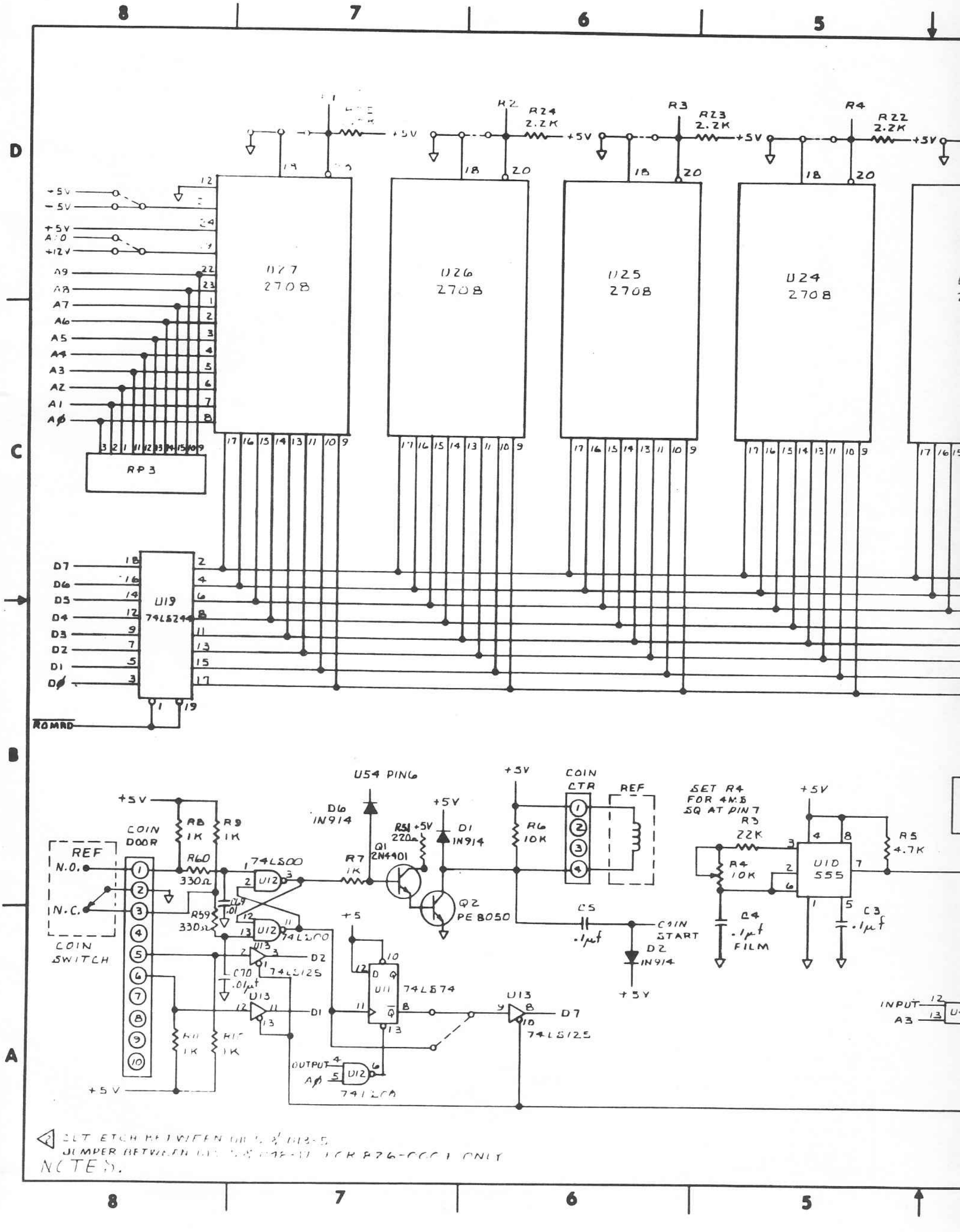
REVISIONS
ZONE
LTR
DESCRIPTION
DATE
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Z80
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74LS10
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74LS08
8216
5101
U17
U18
U33
U34
U35
U36
U37
U38
U39
U52
U54
U70
U71
VIDRD
VIDWR
MEMR
MEMW
MREQ
IOW
IORD
WAIT
INT
NMI
BUSRQ
BUSAK
HLT
RFSH
RESET
RD
WR
IORQ
R1
R2
R3
R4
R5
R6
R7
R8
CMOS RAM Vcc
Q3 2N4403
Q4 2N4403
Q5 2N4401
R12 1K
R13 4.7K
R14 4.7K
R15 22K
R16 5.6K
R17 1K
C6 10µf 25V TANT
D2 1N4002
KEY
BATT
+5V
7404
PARTS LIST
QTY REQD
CODE IDENT
PART OR IDENTIFYING NO.
NOMENCLATURE OR DESCRIPTION
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS
DECIMALS
ANGLES
.XX ±
.XXX ±
MATERIAL
FINISH
CONTRACT NO.
APPROVALS
DATE
DRAWN
CHECKED
826-0004
822-0011
822-0001
814-0019
NEXT ASSY
USED ON
APPLICATION
DO NOT SCALE DRAWING
Gremlin Industries, Inc.
San Diego, California
SCHEMATIC —
C.V. LOGIC
SIZE
CODE IDENT NO
DRAWING NO
REV
D
SHEET



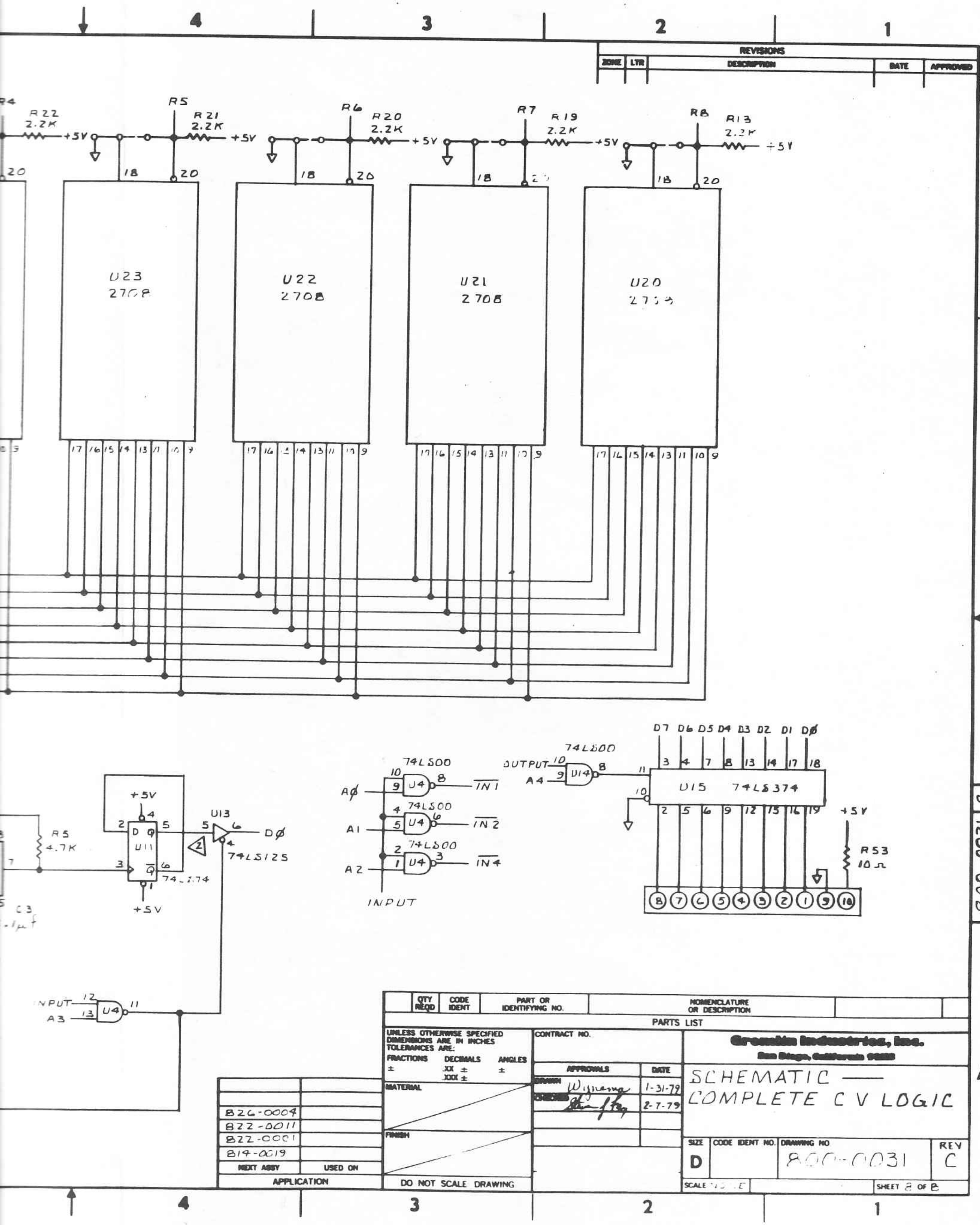
U48
315-0042
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
AØ
N.C.
D0
D1
D2
D3
D4
D5
D6
D7
CMPBL
SYNC
VIDEO
C11
.1μf
C12
10μf
TANT
+5
VRAS
VCAS
VIDWR
74LS04
U64
U62
U61
U60
U59
U58
U57
315-0039
U47
U46
74LS125
VIDRD
DØ
D1
D2
D3
D4
D5
D6
D7
OUTPUT
A3
U12
74LS00
+5V
U5 74LS175
U8 74LS175
U6 74LS163
U7 74LS163
U35
74LS04
U16 74LS374
U28 74LS374
+12V
-12V
U9
555
R1
2.2K
R2
4.7K
C2
.001μf
FILM
C1
.1μf
U31
74LS74
VIDEO
X1
SYNC
U41
74LS08
R30
330Ω
R31
330Ω
R32
1K
Q7
2N4401
Q6
2N4403
D5
1N914
R37
1K
-5V
C17
.1μf
R36
330Ω
R35
330Ω
D6
1N914
R38
1K
R39
1K
R41
75Ω
VIDEO
CUT ETCH AT JUMPER FROM U44 PIN14 TO GND
ADD R54 FOR 822-0001 & 822-0011 ONLY.
NOTES:



REVISIONS
ZONE LTR DESCRIPTION DATE APPROVED
CMPBL
COLR
U31 74LS74
U30 74LS74
E1
E2
+5V
R54 4.7K
CØ
C1
U57 315-0039
U56 315-0039
+12V
-5V
M1
U45
74LS175
U44 32X8 PROM
CS
A3
A4
AØ
A1
A2
U43
74LS174
VIDEO
SEL A
EN
U42
74LS157
R56 1K
R57 1K
R58 1K
74LS00
U32
R26 22 Ω
R27 22 Ω
R28 22 Ω
G
B
R
SYNC
U29
R29 10Ω
COLOR VIDEO
U46
74LS125
D0
D1
D2
D3
D4
D5
D6
D7
74LS374
OUTPUT
A2
U1 74LS244
U2 74LS244
U3 74LS244
IN1
IN2
IN4
RP1
RP2
R50 10Ω
R51 10Ω
DIP SW 8 POS SPST
R52 10Ω
+12V -12V
P1
P2
P3
R38 1K
Q9 2N4401
R40 75 Ω
D6 IN914
Q8 2N4403
R39 1K
C18 .1μf
AUX VID
VIDEO
PIN 6 U55
826-0004
822-0011
822-0001
814-0019
NEXT ASSY
USED ON
APPLICATION
QTY REQD
CODE IDENT
PART OR IDENTIFYING NO.
NOMENCLATURE OR DESCRIPTION
PARTS LIST
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ±
DECIMALS .XX ± .XXX ±
ANGLES ±
MATERIAL
FINISH
DO NOT SCALE DRAWING
CONTRACT NO.
APPROVALS
DATE
DRAWN
CHECKED
2-5-79
2-7-79
Gremlin Industries, Inc.
San Diego, California
SCHEMATIC
COMPLETE C.V. LOGIC
SIZE D
CODE IDENT NO.
DRAWING NO.
REV C
SCALE NONE
SHEET 7 OF 8
800-0031 C



8
7
6
5
D
C
B
A
U27
2708
U26
2708
U25
2708
U24
2708
R2
R24
2.2K
R3
R23
2.2K
R4
R22
2.2K
+5V
A9
A8
A7
A6
A5
A4
A3
A2
A1
AØ
RP3
D7
D6
D5
D4
D3
D2
D1
DØ
U19
74LS244
ROMRD
U54 PIN6
D6
IN914
+5V
D1
IN914
R51
220Ω
Q1
2N4401
Q2
PE 8050
R7
1K
COIN
CTR
REF
R6
10K
C5
.1μf
COIN
START
D2
IN914
SET R4
FOR 4MS
SQ AT PIN 7
R3
22K
R4
10K
C4
.1μf
FILM
U10
555
R5
4.7K
C3
.1μf
REF
N.O.
N.C.
COIN
SWITCH
COIN
DOOR
R8
1K
R9
1K
R60
330Ω
R59
330Ω
C69
.01
C70
.01μf
74LS00
U12
U13
74LS125
U11
74LS74
OUTPUT
AØ
74LS00
INPUT
A3
R11
1K
R12
1K
NOTES:



REVISIONS
ZONE
LTR
DESCRIPTION
DATE
APPROVED
R5
R21 2.2K
R6
R20 2.2K
R7
R19 2.2K
R8
R13 2.2K
+5V
R22 2.2K
U23 2708
U22 2708
U21 2708
U20 2708
D7 D6 D5 D4 D3 D2 D1 DØ
74LS00
OUTPUT
A4
U14
U15 74LS374
AØ
A1
A2
U4
IN1
IN2
IN4
INPUT
R53 10Ω
R5 4.7K
U11
74LS74
U13
74LS125
DØ
C3
A3
PARTS LIST
QTY REQD
CODE IDENT
PART OR IDENTIFYING NO.
NOMENCLATURE OR DESCRIPTION
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS
DECIMALS
ANGLES
MATERIAL
FINISH
CONTRACT NO.
APPROVALS
DATE
DRAWN
CHECKED
1-31-79
2-7-79
Gremlin Industries, Inc.
San Diego, California
SCHEMATIC — COMPLETE C V LOGIC
SIZE D
CODE IDENT NO.
DRAWING NO. 800-0031
REV C
SCALE
SHEET 8 OF 8
826-0004
822-0011
822-0001
814-0019
NEXT ASSY
USED ON
APPLICATION
DO NOT SCALE DRAWING
800-0031 C